PLACER COUNTY
RESORT TRIANGLE
TRANSPORTATION PLAN

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SEPTEMBER 2020

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Resort Triangle Transportation Plan

Location

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PLACER COUNTY

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Cover image by Damian Stefanakis, Kittelson

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Source: Mick Haupt, Unsplash

INTRODUCTION

With an abundance of opportunities for outdoor recreation, the Resort Triangle attracts regular visitors and second homeowners from throughout Northern California as well as less frequent visitors from across the country and abroad. Visitors come for the natural, scenic beauty and to engage in a variety of year-round outdoor activities, including lake activities (e.g., beaches), skiing/snowboarding, backpacking, hiking, fishing, boating, biking, running, and many others. As a result, the area experiences significant peaks in tourism in both winter and summer seasons. The majority of visitors arrive in personally owned or rented vehicles via I-80 traveling through Truckee onto SR 89 or SR 267. The Resort Triangle is also home to year-round residents and employers who live in the mountainous, low density communities dispersed throughout the area.

This Plan presents projects and programs that will provide more reliable and enjoyable ways to travel within the Resort Triangle improving the experience of recreating, shopping, dining, working, and living in North Lake Tahoe.

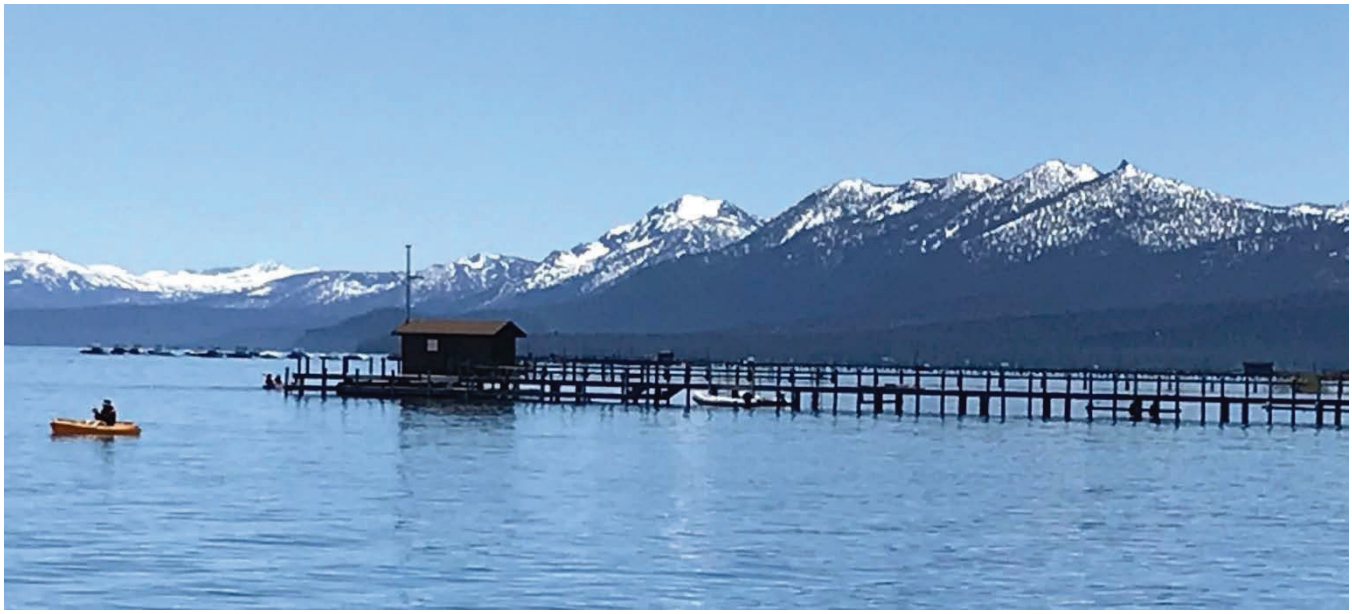
The Resort Triangle is generally defined as the area shaped by SR 89, SR 267 and SR 28 in eastern Placer County and at the northern side of the Tahoe Basin. During peak visitor seasons, vehicle congestion and delay overwhelm the corridors (i.e., SR 89, SR 267, and SR 28) that connect commercial town centers and recreational areas. Those same key corridors also serve as main streets in the town centers and regional routes into and out of the area. The periods of congestion increase

negative impacts to the air quality and surrounding environment. The congestion within the commercial town centers and immediately adjacent to the recreational areas (e.g., beaches) also degrade conditions for people walking or biking.

Placer County (County) is committed to preserving the environment and characteristics of the Resort Triangle that make it the home that year-round residents cherish and a significant destination for outdoor recreation for everyone. Improving the transportation system so that it is adaptable and more resilient in serving the influx of visitors throughout the year is critical for preserving the area's unique characteristics. This can only be achieved through multimodal strategies that make the most of what currently exists, while strategically investing in improvements that enable reliable, efficient travel options that broaden the travel choices beyond personal vehicles. Therefore, this Plan describes recommendations to:

- Enhance transit operations on SR 89 and SR 267 corridors by providing a transit-only lane and/or high-occupancy vehicle (HOV) lane
- Enhance overall operations of steep grades on SR 267 by providing a climbing lane specifically for trucks and transit vehicles
- Encourage people to take transit, carpool, walk, bike, and/or park one time by implementing a paid parking program in the commercial town centers and recreational destinations and use that revenue to invest in further improvements for walking, biking and transit
- Enable people to leave their car behind (at their place of lodging) and take transit by implementing an on-demand microtransit program
- Equip employers with resources and support to provide their employees vehicle commute reduction options

Many of the above recommendations are intended to be seasonal in operation to address the unique challenges and needs that arise from the heavy visitor seasons. Following the Board of Supervisors approval of this Plan, the County will identify and begin implementing the Plan through actions laid out in a supporting Action Plan.



Source: Damian Stefanakis, Kittelson

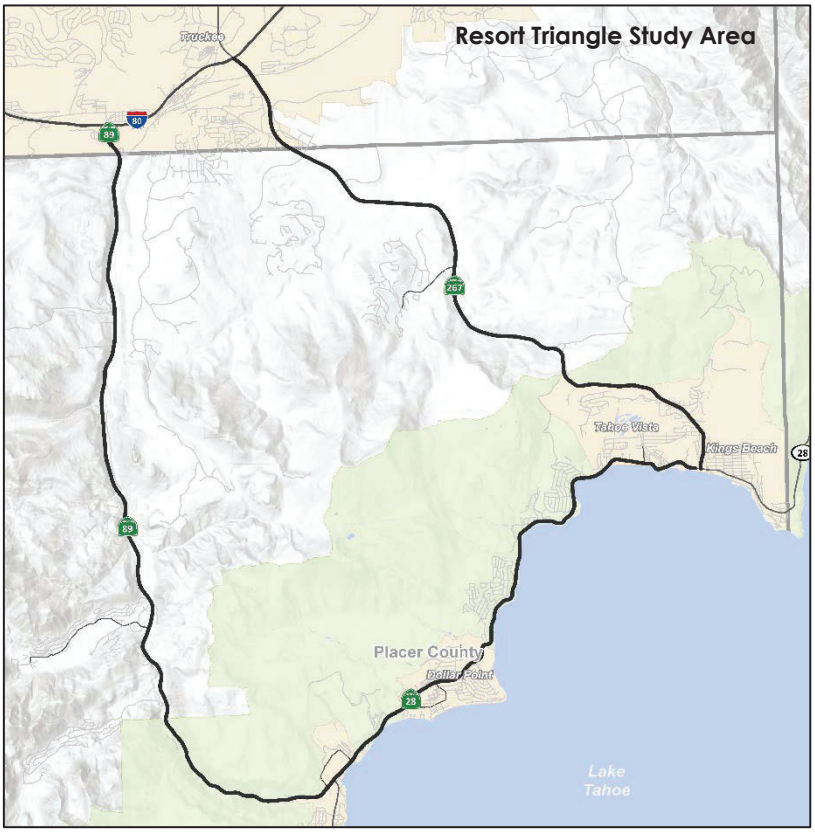
MISSION

The following mission has guided the work leading to the Resort Triangle Transportation Plan (Plan):

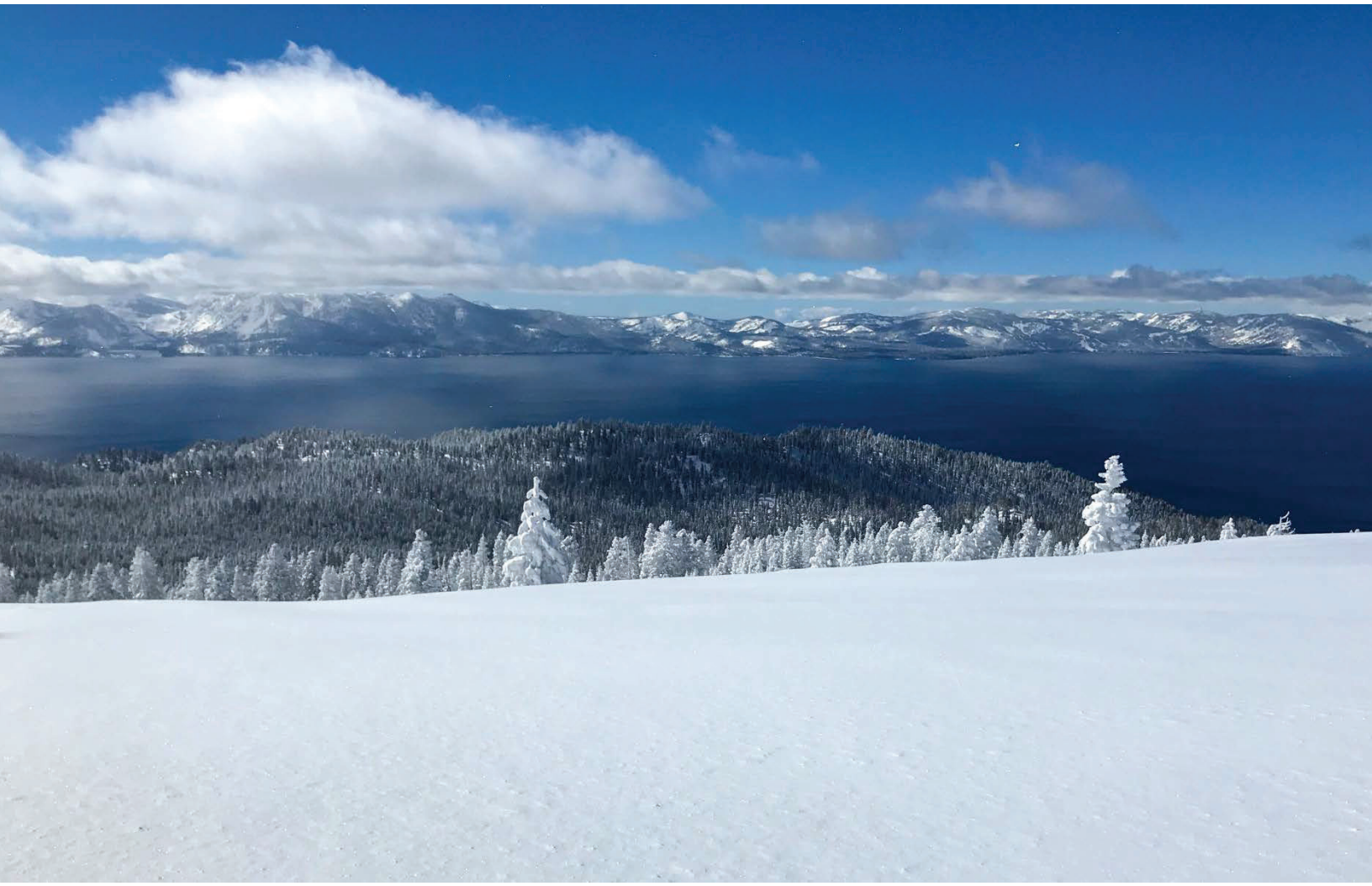
Create a transportation system for tomorrow which will make more efficient use of existing infrastructure, focus on improving mobility for all, reduce transportation impacts on the environment, improve congestion and travel delay, promote and enhance transit services, and provide linkage for non-motorized travel choices.

To achieve this mission, the County focused this work on the transportation-related topics that, when considered together, have the greatest potential to catalyze the degree of reduced congestion envisioned for the area. Those topics tended to focus on addressing these types of questions:

- How do we move people along the key corridors more reliably and efficiently with minimal impacts to the environment and without encouraging more travel in personal vehicles?
- How do we better manage the parking spaces and areas that currently exist in a manner that: (i) best serves the needs of visitors, businesses, and residents; and provides a disincentive for increased vehicle travel?
- How do we provide travel options which make driving personal vehicles less attractive?



The answers to these questions are reflected in the projects and programs described below and throughout this Plan. **The recommended projects and programs collectively encourage and enable people to take transit, carpool, walk or bike.** Encouragement comes in the form of providing free, more reliable, more efficient, and ultimately more frequent transit service that maybe funded, in part, through a paid parking program within the area. The paid parking program also provides an opportunity for funding further enhancements to biking and walking facilities identified in local and regional plans such as the Tahoe City Mobility Plan, Placer County Regional Bikeway Plan, and TRPA Linking Tahoe: Active Transportation Plan.



Source: Aaron Elias, Kittelson

OVERVIEW OF THE PLAN

The Plan is organized to focus on the projects and program recommendations to achieve the mission described above.

- **Background:** Provides a brief description of the technical studies conducted to arrive at the recommendations as well as a description of the community outreach completed over the course of the Plan's development.
- **Recommendations:** Focuses on the recommended projects and programs. Each recommendation identifies high level steps for implementation including necessary partnerships.
- **Appendices:** A set of technical appendices that provide additional details regarding the data collected and analysis conducted that informed the final recommendations.

BACKGROUND

THE NEED FOR INNOVATION

Summer and winter tourism to the Resort Triangle area helps the local economy thrive through the increased activity in the town centers and resorts. With increased tourism and activity also comes significant increases in congestion that degrade the quality of the experience for both residents and visitors.

Traditional transportation projects or strategies to address congestion, such as roadway widening to make space for more personal vehicles, will not be the right solution for the Resort Triangle. These traditional measures often bring negative physical impacts to the environment. They also have a tendency to make it easier, for a brief time, to drive which leads to an increase in the number of people driving and a return to a congested state on a wider roadway. Furthermore, the Resort Triangle area does not need larger roads most of the year.

For much of the year, the existing roadways provide sufficient capacity for residents and visitors, and data shows that the biggest challenges tend to be during weekend holidays when significant congestion can occur. The table below is one example of speed data used in this Plan's development to identify the recommendations. The data in the table shows vehicle speeds on SR 89 approaching Squaw Valley Road at different times of the day across different periods in the year. As shown from the slower speeds and highlighted red numbers, congestion is not an issue for most of the year, but it becomes a significant one during holiday weekends.

SR 89 - Squaw Valley Rd => Pole Creek Rd Northbound

	Shoulder Season				Summer				Winter				MLK Jr. Day and Presidents Day			
Time Period	Weekday	Friday	Saturday	Sunday	Weekday	Friday	Saturday	Sunday	Weekday	Friday	Saturday	Sunday	Friday	Saturday	Sunday	Monday
6am-7am	54	53	49	56	56	51	55	53	51	51	51	47	37	46	47	38
7am-8am	48	50	54	52	54	54	48	47	48	53	49	43	40	39	46	35
8am-9am	44	49	55	53	52	50	49	48	47	51	47	39	40	41	50	36
9am-10am	47	49	48	52	51	52	50	47	47	51	48	43	44	40	43	33
10am-11am	43	48	53	50	50	49	48	50	47	51	48	42	41	44	43	33
11am-12noon	44	54	52	50	49	49	49	48	47	52	49	43	40	50	42	29
12noon-1pm	44	48	49	53	49	51	50	49	46	49	48	43	46	44	40	22
1pm-2pm	43	48	50	50	48	50	50	49	46	50	45	43	41	41	38	37
2pm-3pm	46	53	49	55	50	51	51	49	47	49	41	40	46	46	39	31
3pm-4pm	49	49	50	51	50	50	51	48	44	45	39	33	41	38	34	24
4pm-5pm	51	52	51	51	49	50	50	49	41	34	30	34	39	39	32	15
5pm-6pm	51	53	51	51	50	49	52	50	41	37	29	29	45	32	28	13
6pm-7pm	53	52	50	51	51	52	49	48	45	45	42	45	40	38	30	19
7pm-8pm	50	50	52	53	47	48	55	52	43	47	48	46	47	52	34	21

Legend	Speed/Color
Lowest Speed	13
Median Speed (50th perc.)	48
Highest Speed	56

** Values based on speeds presented in table*

Innovative, best practice strategies from the transportation industry are needed to make the most of what is already built and to invest thoughtfully in projects and programs that will reduce dependency on personal vehicles. The recommended projects and programs extract and apply successful innovation from similar mountain recreation communities in areas such as Colorado, as well as from more urbanized areas such as Sacramento. The seasonal and dynamic use of the recommended strategies is what make them effective solutions for the Resort Triangle. These strategies can be employed during tourism seasons and/or peak holiday weekends to better manage the system and then disabled during parts of the year when there is not the need.

PROMISING FOUNDATION

People visiting and living in the Resort Triangle already exhibit a willingness to walk, bike, and take transit when those options are provided to them and sufficiently convenient.

***Summer Daily Trail Use** (Total Bicycle and Pedestrian)*

Location	
Pinedrop Lane, Kings Beach	125
Carnelian Bay (Sidewalk Near Garwoods)	136
N. Shore Trail @ Lake Forest Road	338
Truckee River Trail (South of River Ranch)	1,799
North Lake Boulevard / SR 89	595
SR 267 / Schaffer Mill Road	116
SR 28 / Bear Street	1,558
SR 89 / Squaw Valley Road	2,044

Source: TRPA Website, TCPUD Annual Survey, and LSC

For example, summer daily trail use at several locations within the study area show counts of people well into the hundreds and some over 1,000 people in a day. Furthermore, when surveyed at four of these locations, 44 percent to 76 percent of people surveyed stated they would have driven for that trip, rather than walk or bike, if the trail did not exist. People will walk and bike when they are given a safe and enjoyable space to do so.

Data also shows people are interested in taking transit particularly in the winter season. Information from Tahoe Regional Transportation Planning Agency (TRPA) surveys show about a 10 percent transit mode split for Kings Beach and slightly less than 5 percent mode split for Tahoe City and the West Shore during the winter. Tahoe Truckee Area Regional Transit (TART) service also has reported a substantial increase in ridership by about 40 percent since moving to fare free service. Finally, on-demand microtransit service by the Mountaineer also runs a successful program. It carried 81,300 riders in the 2018/2019 season providing service in Squaw Valley (all days) and Alpine Meadows (weekends).

Collectively, this data indicates that there is a promising foundation and interest from visitors and residents to walk, bike, and take transit when the facilities and programs exist to make it feasible, convenient, and logical.

COORDINATED EFFORT

Placer County's partners in this effort to enhance the transportation system in the Resort Triangle include:

- California Highway Patrol (CHP)
- Caltrans
- North Tahoe Public Utility District
- Nevada County Transportation Agency
- Placer County Transportation Planning Agency (PCTPA)
- Sacramento Area Council of Governments (SACOG)
- Tahoe Regional Transportation Planning Agency
- Tahoe Transportation District (TTD)
- Town of Truckee
- Truckee North Tahoe Transportation Management Association (TNT - TMA)
- Truckee Tahoe Airport District

> *"Alone we can do so little; together we can do so much."*
> *– Helen Keller*

- North Tahoe Resort Association
- Ski Resorts (Squaw/Alpine, North Start, Granlibalkken, Homewood)

These organizations were part of a Project Development Team (PDT) used to provide input regarding the data, analysis, findings, and recommendations that informed this Plan. The PDT met seven times over the course of the Plan's development to review information and provide input.

This Plan complements the work that has been completed as part of:

- Transportation Demand Management Strategies for North Lake Tahoe (2019)
- TRPA Threshold Update: Vehicle Miles Traveled Threshold Standard (Draft 2019)
- TRPA Lake Tahoe Region Safety Strategy (2019)
- Placer County Regional Bikeway Plan (2018)
- SR 89 Squaw Valley to Truckee Demonstration Bus Lane Study (2017)
- TRPA Regional Transportation Plan (2017)
- Eastern Nevada County Transit Development Plan (2017)
- Tahoe Basin Area Plan (2017)
- Lake Tahoe Corridor Connection Plan (2017)
- Truckee TART Systems Plan (2017)
- Tahoe City Mobility Plan (2016)
- Truckee North Tahoe Regional Workforce Housing Needs Assessment (2016)
- Squaw Valley Peak Day Parking Plan (2016)
- North Tahoe Parking Study (2015)
- Truckee Trails & Bikeways Master Plan (2015)
- Placer County Tourism Master Plan (2015)
- North Lake Tahoe Resort Association Visitor Research Summary (2014)
- The Economic Significance of Travel to the North Lake Tahoe Area (2013)
- Northstar Traffic and Parking Management Plan (2013 – Updated Annually)
- North Lake Tahoe-Truckee Integrated Bicycle Plan (2011)
- Lake Tahoe Region Bicycle and Pedestrian Plan (2010)

The recommendations and information presented in this Plan are also informing ongoing work that the County and its partners continue to advance to improve the Resort Triangle.

Source: Mark Heisinger, Kittelson

TECHNICAL STUDIES

Several technical studies were completed in order to arrive at informed recommendations and organized around four topics: (1) adaptive corridor management; (2) parking management; (3) transportation demand management; and (4) reducing vehicle miles traveled in the study area. The following are brief descriptions of what each study considered.

ADAPTIVE CORRIDOR MANAGEMENT

The Adaptive Corridor Management study estimated mobility benefits of dynamic corridor improvements on SR 89 and SR 267 within the Resort Triangle. The study developed estimates of increasing the person-capacity and reducing congestion-related delays for travelers on the two State routes. Alternatives considered included bus-on-shoulder operations, adding a reversible high occupancy vehicle lane, and adding a reversible general-purpose lane during peak periods. Based on this analysis, comments received from the Plan PDT, and follow-up meetings with Caltrans and California Highway Patrol, a recommended package of near-term, mid-term, and long-term improvements were identified for the two State routes. These recommendations and associated considerations for further evaluation as part of future project development efforts are presented in this Plan.

PARKING MANAGEMENT

The Parking Management study considered existing available parking and parking use through summer and winter in three different types of geographies: (1) commercial town centers; (2) beach recreational areas; and (3) ski resorts. Based on the existing conditions assessment, review of best practices in other similar mountain recreation cities and towns as well as more urban areas, the findings were used to identify a recommended seasonal parking management program for the Resort Triangle.

TRANSPORTATION DEMAND MANAGEMENT

The Transportation Demand Management (TDM) study advanced the most promising TDM strategies that had been identified and adopted by the Placer County Board of Supervisors in the Transportation Demand Management Strategies for North Lake Tahoe (2019) plan. The strategies included paid parking (addressed in this Plan via the Parking Management study noted above), microtransit, and an improved employee commute trip reduction ordinance. Recommendations from this continued work is presented in the Plan sections regarding microtransit service and best practices for trip reduction ordinances and programs.

VEHICLE MILES TRAVELED

Vehicle miles traveled (VMT) measures the distance driven by vehicles within a specified area. For each trip that a person makes while driving in a car, it is the cumulative distance driven. Local agencies within the state of California will be required, as of July 1, 2020, to assess the impacts of transportation associated with land use and transportation projects based on those projects' VMT. The work effort related to VMT as part of this Plan was coordinated with a Countywide effort to establish VMT thresholds as well as potential strategies to reduce VMT. The most significant way to reduce VMT in the Resort Triangle is to implement projects and program recommendations for the adaptive corridor, parking management, microtransit, and transportation demand management strategies for employers. Continuing work to implement the active transportation plans to further improve facilities and opportunities for walking and biking will complement the recommendations in this Plan and further help reduce vehicle miles traveled.

COMMUNITY OUTREACH

STAKEHOLDER REPRESENTATIVE GROUP

As part of this Plan's development, a Stakeholder Representative Group (SRG) was formed to engage a comprehensive set of organizations, bring a variety of perspectives and disciplines together, and gather input on the types of strategies considered and data and information used to inform the analysis and the recommendations. The SRG met twice during the Plan's development. The first meeting was to gather input on the data and information used to inform the analysis and types of strategies being considered. The second meeting focused on discussion of the draft recommendations. Appendix V contains the meeting summaries from the first and second SRG meetings. This group was also invited to comment on the specific content of the draft plan. The organizations that were engaged through the SRG were:

- North Tahoe Business Association (NTBA)
- Community Collaborative of Tahoe Truckee
- Tahoe City Downtown Association/Visit Tahoe City
- League to Save Lake Tahoe
- Tahoe Regional Planning Agency (TRPA)
- North Tahoe Regional Advisory Council
- Northstar
- Tahoe Fund
- Placer County Air Pollution Control District

- Homewood Mountain Resort
- Tahoe Sierra Board of Realtors
- Sustain Tahoe
- North Tahoe Fire
- North Lake Tahoe Resort Association
- Tahoe City Public Utility District
- Tahoe Rim Trail Association
- Placer Independent Resource Services (PIRs)
- Truckee Visitor Center / Truckee Chamber of Commerce
- Go Tahoe North
- Truckee Trails Foundation
- Lake Tahoe Bicycle Coalition
- Tahoe Area Mountain Biking Association (TAMBA)
- Community Recovery Resources / Grant Wellness Center
- Truckee Tahoe Community Foundation
- Parasol Tahoe Community Foundation
- Truckee-Donner Historical Society
- US Forest Service – Lake Tahoe Basin Management Unit
- California Tahoe Conservancy
- Washoe County
- California Regional Water Quality Control Board – Lahontan Region
- Placer County Department of Health and Human Services
- Placer County Public Health Division
- Granlibakken
- Northstar General Management
- Sierra Business Council
- North Tahoe Public Utility District
- Squaw-Alpine
- Sierra Club – Placer Group (Mother Lode Chapter)
- Tahoe Mountain Resorts Foundation
- Tahoe Truckee Area Regional Transit (TART)
- Truckee North Tahoe Transportation Management Association
- Seniors First
- Sierra Community House

- Sierra Senior Services
- Department of Vocational Rehabilitation
- Sierra Nevada Alliance
- Placer Collaborative Network
- Latino Leadership Council
- Tahoe City Conservancy
- Family Resource Center Of Truckee
- Placer County Air Pollution Control District
- Placer County Association of Realtors
- Placer Valley Tourism
- Placer Community Foundation
- Clean Tahoe Program
- United Auburn Indian Community

Source: AIM Consulting

DISADVANTAGED COMMUNITIES

During the Plan's development, outreach was conducted to gather input from disadvantaged communities – communities that experience hardship and challenges related to transportation due to lower income levels, race, ethnicity, language barriers, and/or disabilities. To engage these communities, the project team attended the Snow Fest Event in early March to gather input on topics related to transit and day to day trip making occurred. Appendix V contains the summary of input from that event.

Shortly following that in-person event in early March, shelter-in-place orders and social distancing protocols due to COVID-19 were put into place. Given the inability to hold additional in-person events, the County and team created online virtual engagement workshop for community members to provide input on the draft plan. Those engagement opportunities occurred online over a three-week period from July 27 through August 17, 2020. The section below titled Virtual Community Workshop provides an overview and Appendix V contains a comprehensive summary of the virtual community workshop.

VIRTUAL COMMUNITY WORKSHOP

Due to the COVID-19 pandemic and associated restrictions on in-person gatherings, the disadvantaged communities' outreach and broad community engagement for the Plan was completed online via a virtual community workshop. The virtual workshop was open to the public from July 27 through August 17, 2020. During this time, the project team received more than 420 responses from community members.

The virtual workshop included a series of informational, animated videos narrated by the project team. These videos introduced the plan and explained each of the key proposed strategies. The project team developed the virtual workshop and all informational videos in English and Spanish. Notification for the workshop was widespread while targeting communities in and influenced by the study area. Three email notifications were sent to more than 10,000 community members regarding the virtual workshop opportunity. Additionally, a news release including information about the workshop was sent to Placer County's media distribution list. A series of four paid social media advertisements reached more than 14,000 residents in the Truckee, Tahoe City, and Kings Beach areas. The project team personally reached out to more than 60 community-based organizations and groups to share

information about the virtual workshop with their constituents. More than 20 groups and agencies shared information through an e-newsletter, social media or other communication channel.

Input from the virtual community workshop indicated:

- Indicated slightly more than 55% of respondents were supportive of the adaptive corridor management recommendations to provide a reversible lane for bus only or bus and HOV 4+ vehicles
- Strong support for seasonal microtransit service in the area and nearly equal degrees of support for the four recommended microtransit service areas
- More frequent regional transit service was a recurring comment related to transit usage.
- Approximately, 75% of respondents indicated support for seasonal paid parking as part of a comprehensive approach to parking management in the Resort Triangle

The responses to the survey questions within the virtual community workshop indicated consistent support for the recommendations described further below in the Plan. Comments submitted through the website and related to the draft plan tended to also indicate support while identifying specific questions or concerns regarding steps to implement and fund the Plan's recommendations. Following the Board of Supervisors consideration of the final Plan, the County will create and implement an Action Plan that will strive to address many of the details which were captured in the outreach; including next steps, available funding and funding sources needed for implementation.

SUPPLEMENTAL STAKEHOLDER MEETINGS

Given the nature of some of the recommendations, there were several stakeholders who were engaged in smaller settings to collaborate on specific topics or recommendations. Those supplemental stakeholder meetings involved meeting with:

- Downtown Business Associations regarding a paid parking program in the commercial town centers
- Caltrans and California Highway Patrol regarding the alternative corridor management strategies for SR 89 and SR 267
- TART and the TMA to discuss transit service and the potential for broader microtransit service
- TRPA to discuss resources and programs that encourage commute options for employers and employees in the Tahoe Region

Source: Mark Heisinger, Kittelson

RECOMMENDATIONS

The following provides a detailed explanation of the recommended transportation projects and programs to further enhance the Resort Triangle by reducing reliance on travel in single or low occupancy vehicles. In addition to what is described below, a critical element is continued investment and expansion of the walking and biking facilities in the study area. Further investment in implementing the local and regional pedestrian and bicycle plans is vital in supporting and ensuring the success of the additional recommendations below for the Resort Triangle.

VISION

Transit is a convenient and intuitive option for visitors and residents to use to travel throughout the Resort Triangle Area. An additional lane of capacity on SR 89 and SR 267 could potentially be dynamically managed, encouraging people to take transit or carpool and thereby help to manage congestion during peak periods of travel. There is reliable and convenient fixed route regional transit service and on-demand microtransit service in multiple areas throughout the Resort Triangle, enabling people to park and then move more easily within the Resort Triangle without driving their personal vehicles.

For those that choose or need to drive, the appropriately priced paid parking program creates a reasonable balance of occupied vs. unoccupied parking spots, making it easier to find parking. With improved connections and facilities for people walking and biking, it is comfortable and convenient to walk or bike as part of parking once, taking transit, and/or eliminating the need altogether to get into a motorized vehicle to reach a desired destination. As a result, the commercial centers of the towns are not congested with people in vehicles looking for a parking space or double parking to load/unload passengers and gear. Instead, vehicles are moving at a slow, steady pace through commercial center, while others are able to walk and bike comfortably. Collectively this means, fewer vehicle trips and improved environmental quality for the area.

The revenue generated from the paid parking program helps to fund the transit, walking, and biking improvements in the Resort Triangle and would be focused on areas in which it was collected.

MOVING PEOPLE ALONG KEY CORRIDORS

To achieve the vision for the Plan, improving and managing the SR 89 and SR 267 corridors would encourage increased transit use, help manage trips into the Resort Triangle, and create a more reliable travel experience for residents and visitors. With nearly all trips (94%) along the three state routes starting or ending within the Resort Triangle, and nearly half of trips (46%) travelling between two destinations within the Resort Triangle, providing improved travel options between destinations can help manage peak period travel demands. The Adaptive Corridor Management technical study evaluated the potential mobility benefits of corridor improvements that could be adjusted to serve the varying seasonal and time-of-day travel demands along these two corridors. This evaluation involved analyzing a bus-on-shoulder operations, a reversible high-occupancy vehicle lane, and a reversible general-purpose travel lane to determine the potential benefits and trade-offs of each alternative[1].

Through the technical analysis, project team meetings, and conversations with the Plan PDT, Caltrans, California Highway Patrol, Resort Triangle stakeholders and public input, SR 89 and SR 267 recommendations were identified and refined. These improvements range from near-term improvements that could be immediately advanced for implementation with more limited additional feasibility analysis to long-term improvements that will require

[1] Additional information on the technical analysis can be found in Appendix II.

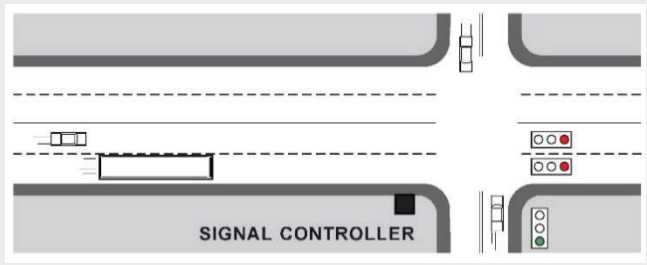
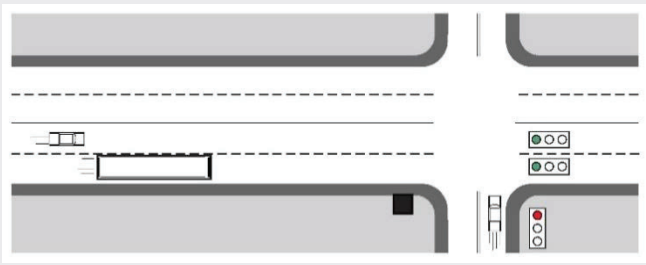
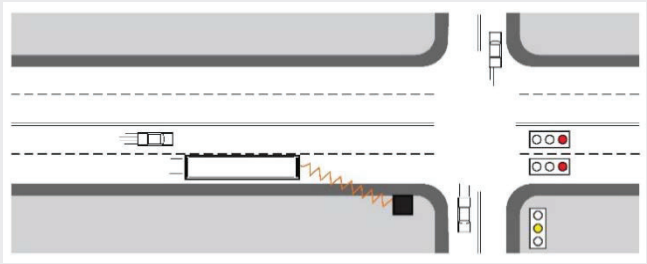
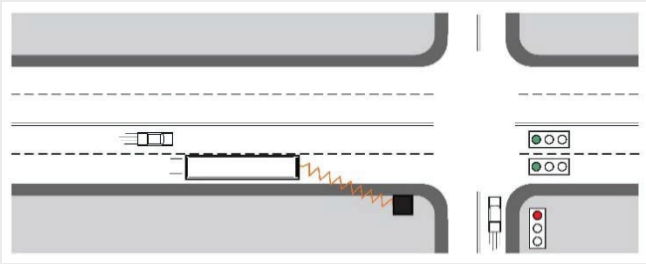
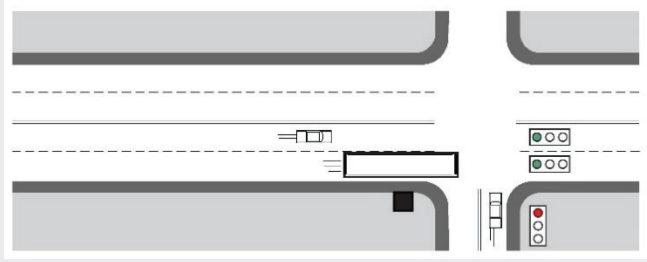
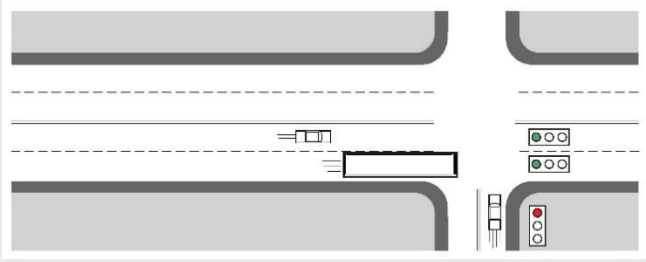
community outreach, more refined feasibility analysis, environmental clearance, and detailed design analyses in order to move forward. Each of the improvement types recommended as part of this Plan are briefly described.

CORRIDOR IMPROVEMENTS

Transit Signal Priority Modifications

Transit signal priority (TSP) modifies the traffic signal timing and/or phasing at an intersection to allow transit vehicles priority at the intersection. Signal timing adjustment could include extending a green signal phase to allow a transit vehicle extra time to clear the intersection or ending a red signal phase early to allow an approaching transit vehicle to receive a green signal ahead of its arrival at the intersection. Corridors with long headways, longer signal cycle lengths, long distances between signals, and signals that favor the cross street would provide the greatest opportunity for TSP benefit. Figure 1 shows examples of red truncation (left) and green extension (right) transit signal priority implementations.

Figure 1: Example Transit Signal Priority Implementations

Red Truncation Transit Signal Priority	Green Extension Transit Signal Priority
1 Bus approaches red signal	1 Bus approaches green signal
	
2 Bus detected by signal controller – side street green phase ended early	2 Bus detected by signal controller – green phase extended
	
3 Bus proceeds on green signal	3 Bus proceeds on extended green signal
	

Source: Adapted from *TCRP Report 165: Transit Capacity and Quality of Service Manual, Third Edition*.

Benefits:

- TSP improvements could significantly reduce transit delay at intersections. The National Association of City Transportation Officials *Transit Street Design Guide* provides examples of TSP reducing overall transit travel times by approximately 10 percent with delay reductions at TSP intersections of up to 50 percent.
- TSP would be most beneficial at intersections with long queues or routes that are commonly delayed. Given the high demand at the signalized intersections along the SR 89 and SR 267 corridors serving the resorts and town centers with long queues during peak seasons, TSP would offer an excellent opportunity to prioritize transit service and reduce transit delays along the two corridors.

Implementation Considerations

- TSP would require traffic signal modifications and new equipment for transit vehicles that enable detection and communication between the transit vehicle and traffic signals.
- Implementation of TSP at any intersection along the two corridors would require coordination between Placer County, TART, and Caltrans to determine the appropriate on-board technology, signal technology, and communications protocols. This may require an agreement between the agencies and coordination on equipment purchases.
- In addition, Placer County, TART, and Caltrans would need to coordinate to refine the TSP strategies to be implemented and the system goals to evaluate trade-offs between transit delay reductions and potential operational effects of any transit priority strategy.
- Further detailed project development studies would need to evaluate the operational changes to the traffic signals. In particular, queue lengths along the corridor would need to be evaluated during peak congestion to determine the appropriate distance for granting a transit priority request.
- The Placer County Tahoe District Capital Improvement Program includes $500,000 each in funding for transit priority infrastructure on SR 89 and SR 267 (a total of $1 million in infrastructure improvements).

Source: Damian Stefanakis, Kittelson

Transit Queue Jump Lanes

Transit queue jump lanes provide a short, dedicated transit lane with a leading bus interval or active TSP to give buses a "head-start" from a signalized intersection. Queue jump lanes may be a standalone bus-only lane or may be combined with a dedicated right-turn lane using a protected right-turn signal phase in combination with "Right Turn" and "Except Buses" signs. Queue jump lanes can allow for near-side, far-side, or no stop operations. When implemented for no stop or far-side stop locations, buses would receive priority to proceed across the intersection. Figure 2 shows examples of transit queue jump lanes using a shared right-turn lane for both near-side and far-side implementations.

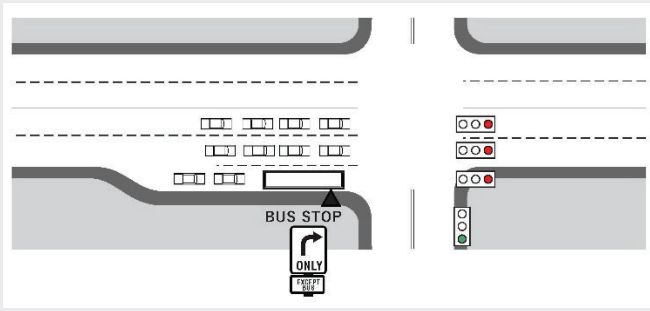
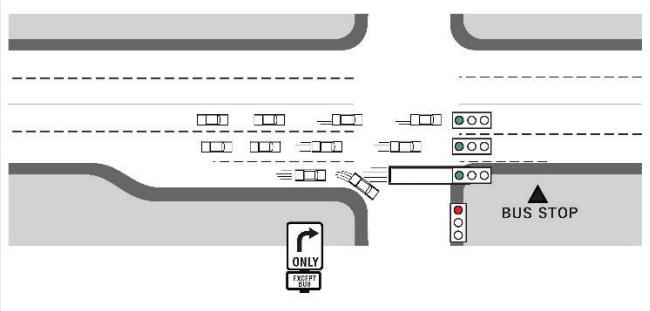
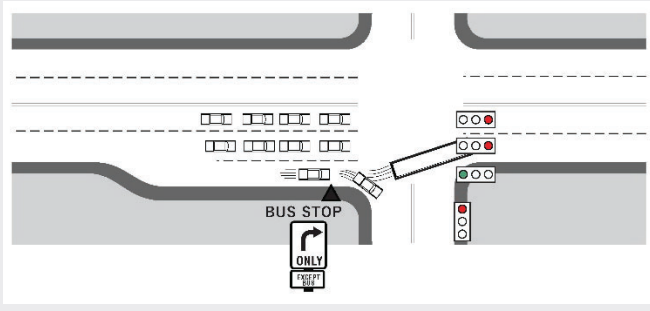
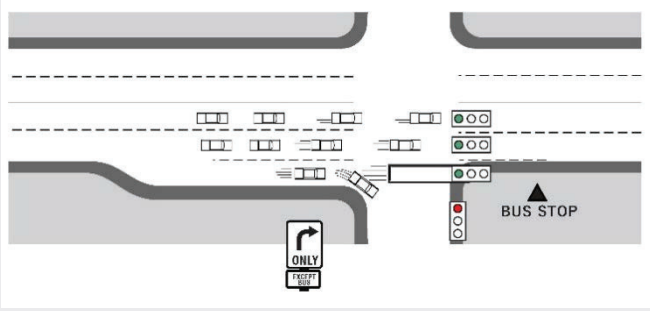
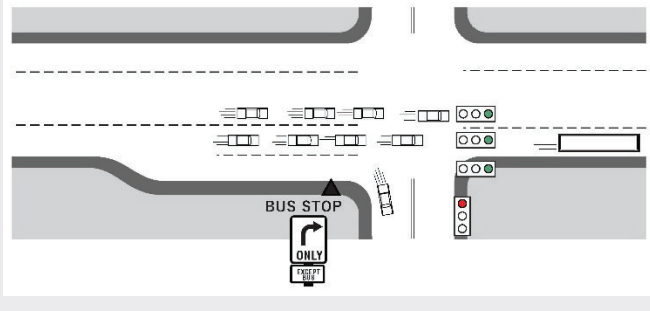
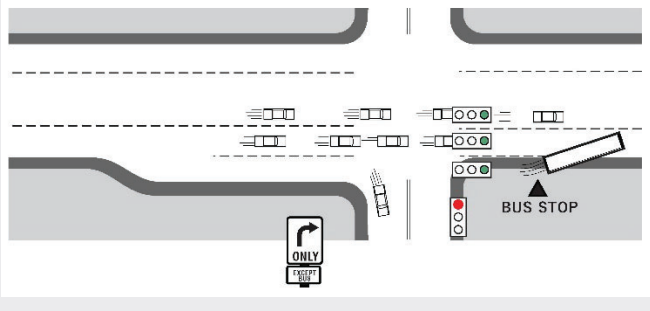
Benefits:

- Where signalized intersections have long queues during peak periods, a queue jump lane would allow buses along the corridor to bypass any queuing delay and "jump" ahead of motor vehicles to continue along the route.
- Queue jump lanes have been shown to be highly effective and reduce transit vehicle delay by 3- to 17 percent with transit signal priority.

Implementation Considerations

- At locations with long right-turn queues, a combined queue jump lane/right-turn lane would be ineffective. Where right-turn queuing is present consistently, right turns should be accommodated separately from transit vehicles.
- Where right-turn queuing is not consistently present, the queue jump lane can be combined with the right-turn lane. A combined queue jump lane/right-turn lane should be long enough to allow right-turn storage and still permit buses to reach the queue jump during each cycle.
- Traffic signal modifications may be required to provide a separate transit signal head and/or the protected right-turn signal head (excepting buses) at the intersection. With the installation of a dedicated transit signal at the intersection, additional detection would be required to detect the presence of the transit vehicle and trigger the queue jump transit priority phase.
- Transit queue jump lanes would also be eligible for the Placer County Tahoe District Capital Improvement Program funding described in the TSP implementation considerations.
- Further detailed project development studies will need to evaluate the operational changes to the traffic signals to accommodate the queue jump lanes and any potential trade-offs associated with the transit improvements.

Figure 2: Example Transit Queue Jump Lane Implementations

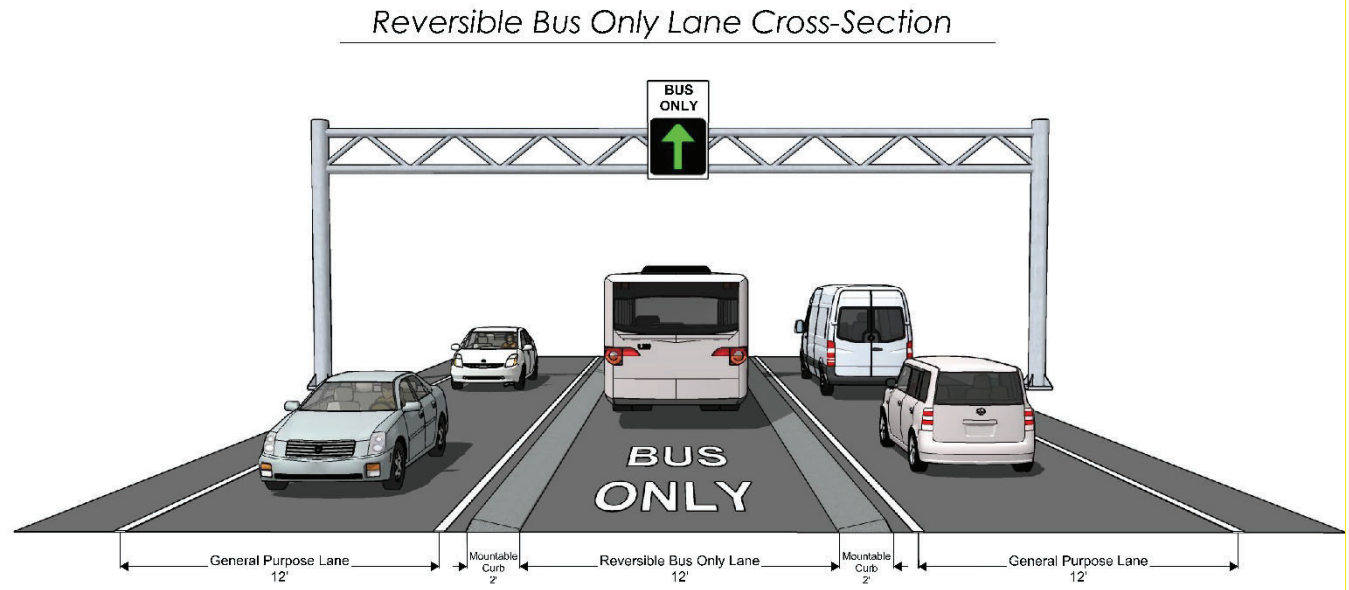
Near-Side Stop Shared Queue Jump/Right-Turn Lane	Far-Side Stop Shared Queue Jump/Right-Turn Lane
1 Passengers board during red	1 Bus waits in right-turn lane during red
	
2 Bus receives green before other vehicles	2 Bus pulls into far-side stop on green and passengers board
	
3 Other vehicles proceed a few seconds later	3 Bus merges into general traffic
	

Source: Adapted from *TCRP Report 165: Transit Capacity and Quality of Service Manual, Third Edition*.

Reversible Bus-Only Lane

Transit lanes provide a dedicated lane for transit use through a combination of signs and markings along a corridor. Dedicated transit lanes allow transit vehicles to continue past congested portions of the two corridors and maintain more reliable and faster transit service. Given the directional nature of peak travel within the Resort Triangle, a center-running, reversible bus-only lane along the congested portions of the two corridors would allow transit service to use the bus-only only directionally based on congested conditions to reduce bus travel time delays due to queuing and congestion. At signalized intersections, the bus-only lane would complement the TSP and queue jump lanes discussed above to allow buses priority at the intersection. The bus lane would be physically separated from general-purpose lanes to prevent illegal use of the bus-only lane. Figure 3 shows a conceptual cross-section of a reversible bus-only lane implementation.

Figure 3: Conceptual Reversible Bus-Only Lane Cross-section



Source: Kittelson & Associates, Inc., 2020.

Benefits:

- During congested periods on the study corridors, the reversible bus-only lane would help transit service avoid congestion and improve transit reliability and travel times. Transit lanes with congestion and high motor vehicle traffic volumes are good candidates for dedicated lanes to improve on-time performance and efficiency of bus operations.
- Adding a bus-only lane would have minimal impacts on traffic operations along the corridor, except at intersections where TSP or other transit priority strategies are implemented.
- The reversible bus-only lane can be operated flexibly to respond to traffic conditions. Additionally, motor vehicles could be accommodated at all times or during peak hours. See the Reversible High-Occupancy Vehicle (HOV) Four-Plus/High Occupancy Toll (HOT) Alternative subsection below.

Implementation Considerations

- Adequate shoulder widths should be provided along the corridor to allow for safe vehicle operations as well as space for enforcement activities to occur or disabled vehicles to safely pull over.
- Roadway widening will be necessary along segments of the corridors. Additional analysis will be required to determine the extent of the widening required.
- Any implementation of separation from general-purpose traffic will have trade-offs associated with either safety or the ease of maintenance. The goal would be to arrive at a solution that deters the public and tourists from entering the transit only lane, allows emergency service vehicles to cross the transit only lane whenever needed, and allows Caltrans maintenance to effectively plow the roadway under snow conditions. Considerations for three potential separation forms are briefly described below:

    1. **Flush Implementation:** The transit lane would be separated from general-purpose traffic using striping similar to an HOV or HOT lane and signing. If a buffer is provided between the bus-only lane and general-purpose lane, this lane could be separated using milled-in rumble stripes.

    2. **Curbed Implementation:** The transit lane would be separated from traffic using a low-profile, rolled curb. This would likely require a buffer to allow snow plowing an acceptable error tolerance to clear the general-purpose lane without hitting the curb. The buffer would likely consist of at least two feet of buffer space between the general-purpose lane and the bus-only lane, and a two-foot rolled curb on either side to allow emergency vehicles to crossover the bus-only lane when needed. The buffer could use milled-in rumble stripes as well.

    3. **Raised Implementation**: The transit lane could be raised above the general-purpose lane. This would require additional right-of-way to provide the bus drivers with a wide lane to allow for safe operations under any weather conditions with a wide vehicle lane plus a two-foot buffer on both the raised and lowered side with milled-in rumble stripes and a two-foot rolled curb transition.

    The benefits and drawbacks of any separation implementation will need to be considered and a preferred alternative chosen as part of future project development studies for the recommendation.

- Snow removal strategies would need to be coordinated with Caltrans and Placer County maintenance staff to ensure safe operations of the corridor during snow events. This could entail closing the bus-only lane until snow removal has cleared all of facilities.
- The additional signing, striping, and vertical separation of the transit lane would have aesthetic impacts along the corridor and need to be considered to maintain the character of the corridor.
- To allow for reversible, center-running operations, uncontrolled access along the two corridors would need to be limited or managed to reduce potential conflict points from left-turning vehicles. This access management could take a number of forms; examples of the potential treatments are shown in Figure 4.

    1. **Signalization:** Major access points that are currently unsignalized along the corridor may be considered for signalization to facilitate turning movements across the bus-only lane.

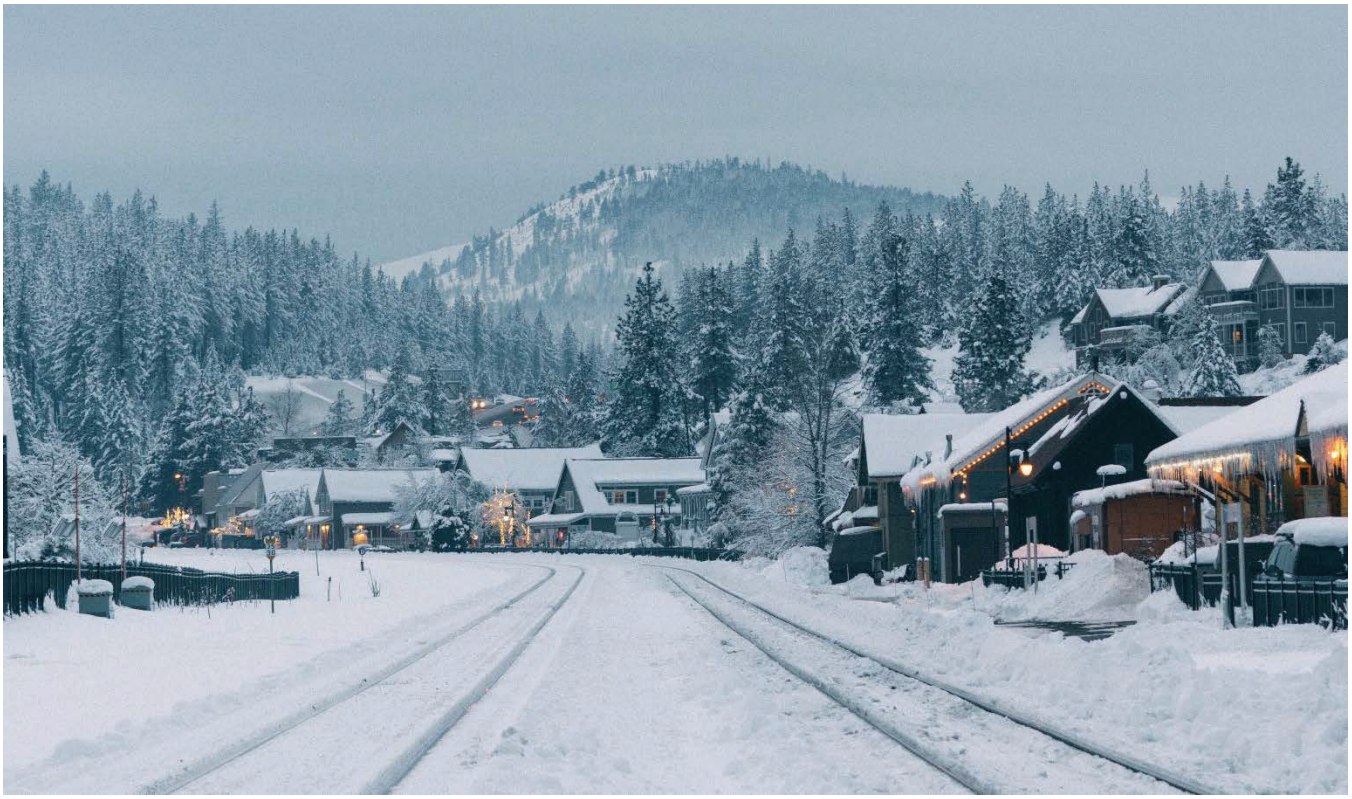
    2. **Roundabout/U-Turn Roundabout:** A roundabout design could be used at either selected existing intersections/access points along the corridor or as a treatment to allow U-turns where left-turn movements are prohibited for an upstream access point. A "U-turn Roundabout" is a two-legged roundabout that allows U-turns and manages access along the corridor. This type of roundabout would allow vehicles to make U-turns along the corridor safely while providing nearly continuous flow for through vehicles (except for when a vehicle wants to make a U-turn). Roundabouts can also help manage speed based on the circulating speed of the roundabout to help reduce unsafe speeds during less congested periods along

the corridor as well as to help "meter" traffic entering heavily congested intersections during peak periods. This would require ending the bus-only lane on the approach to the roundabout.

3. **J-Turns:** Another option would be to use J-Turn (or "Loon") intersections to provide set locations where a vehicle would be allowed to turn left to execute a J-turn and proceed in the opposite direction. Vehicles would enter a left-turn lane along the mainline and turn left into the J-turn receiving area to turn around and then safely merge with traffic. This would require ending the bus-only lane on the approach to the J-turn to permit left turns.

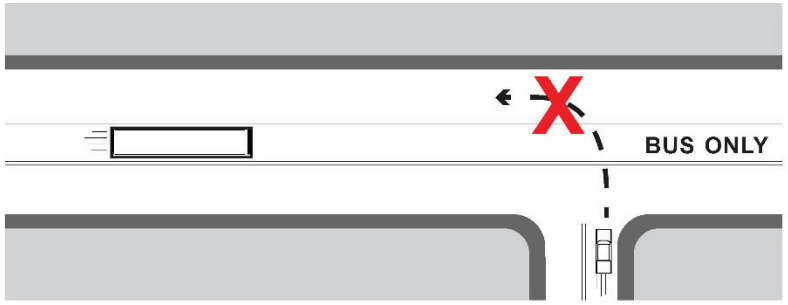
4. **Bus-Only Lane Merge to Allow Left Turns:** A final option would be to allow left turns/U-turns at selected locations along the corridor by temporarily terminating the bus-only lane. To allow for these movements, the transit lane would be terminated in advance of the desired left-turn location. This would require the determination of the appropriate storage needed for turning vehicles as well as an adequate buffer and transition for buses to merge into the general-purpose lane.

- Where left turns are prohibited along the corridor, the range of access management strategies noted above could be considered and spaced along the corridor to provide consistent access and to reduce the amount of out-of-direction travel. The access management strategies come with different cost/benefit trade-offs for access, safety, operations, and transit service. While all are feasible to implement along the corridor, additional feasibility analysis for specific locations and coordination with Caltrans would be required to determine the appropriate strategy as the reversible bus-only lane is implemented.
- Given the reversible lane would require power and communication to operate safely and the potential loss of power during emergency situations, local battery power units should be considered for all associated equipment and failure modes should be established for lane controls. Additionally, the local control cabinets should be made accessible to law enforcement, maintenance, and fire personnel to allow conversion of the corridor into an inbound or outbound condition, as required during emergency operations.

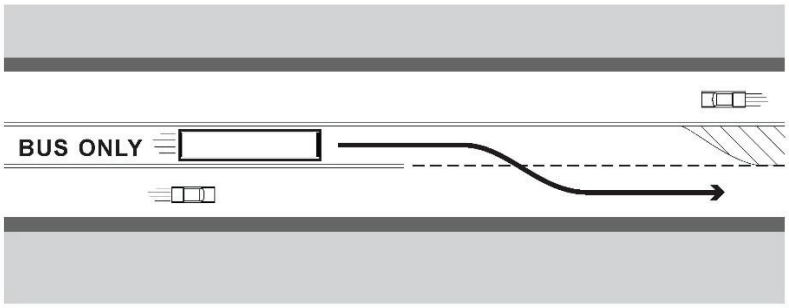


Source: Wil Stewart, Unsplash

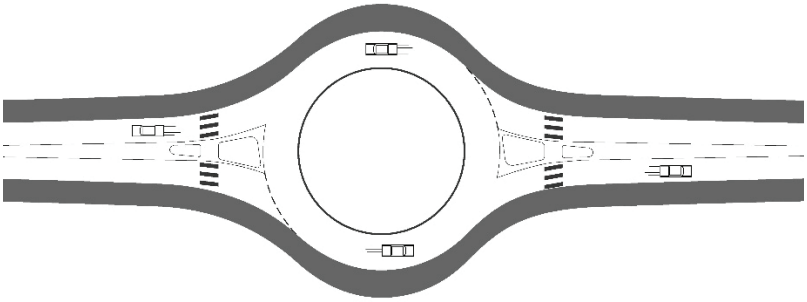
Figure 4: Bus-Only Lane Access Management Treatment Strategies



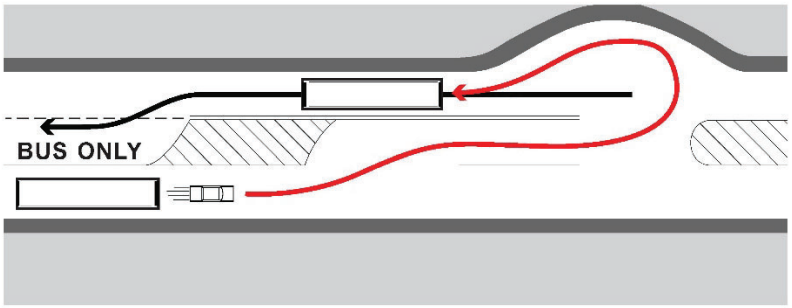
(a) Left-Turn Restriction at Access Point



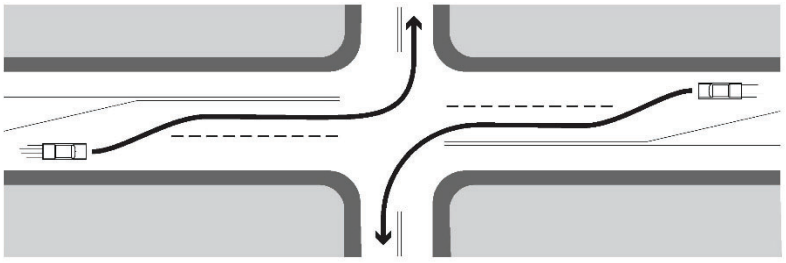
(b) Bus-Only Lane Termination for Treatment



(c) U-Turn Roundabout



(d) J-Turn Treatment



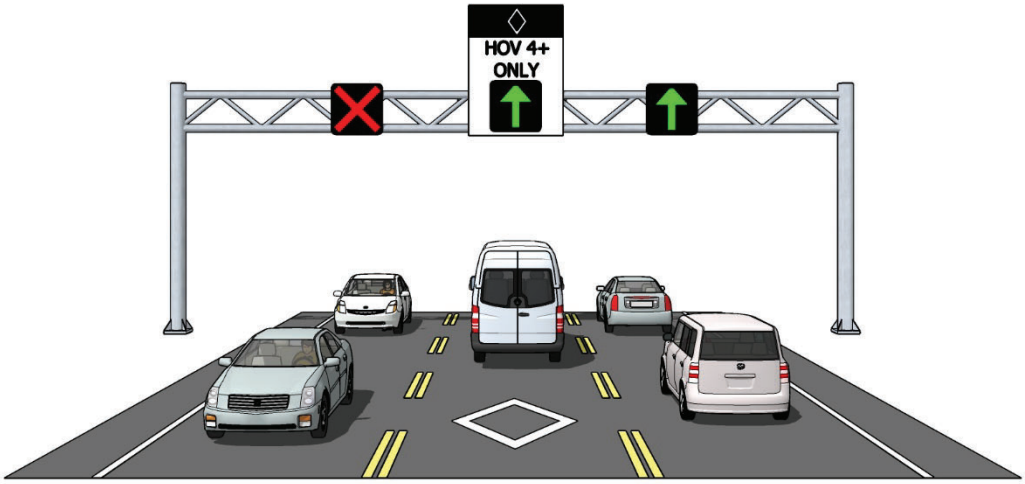
(e) Left-Turns Lane Treatment

Source: Kittelson & Associates, Inc., 2020.

Reversible HOV Four-Plus/HOT Alternative

The center-running reversible bus-only lane could be explored with an alternative to consider a reversible high-occupancy vehicle four-plus/high-occupancy toll (HOV 4+/HOT) lane. Given that this lane would be designed for the general driving public, it would require additional safety and notification features to implement and reduce the potential for wrong-way conflicts. In particular, a reversible HOV 4+/HOT lane would likely require more stringent access control along the corridor as well as require additional dynamic signing (e.g., gantries spaced evenly along the corridor) to provide real-time direction of travel information to drivers. This would incur significant additional implementation costs and would have a significant aesthetic impact on the corridors. Additionally, some form of electronic toll collection would likely be necessary in order to implement the HOT lane alternative. This could be coordinated with the same system used for toll facilities in the San Francisco Bay Area to assist with rapid adoption by visitors from San Francisco Bay Area. The feasibility of this recommendation would need to be explored in future project development phases to determine the appropriate treatments for safe operations along the two corridors. Figure 5 shows a conceptual cross-section of a reversible HOT 4+/HOT lane.

Figure 5: Conceptual Reversible HOV 4+/HOT Cross-section



Source: Kittelson & Associates, Inc., 2020.

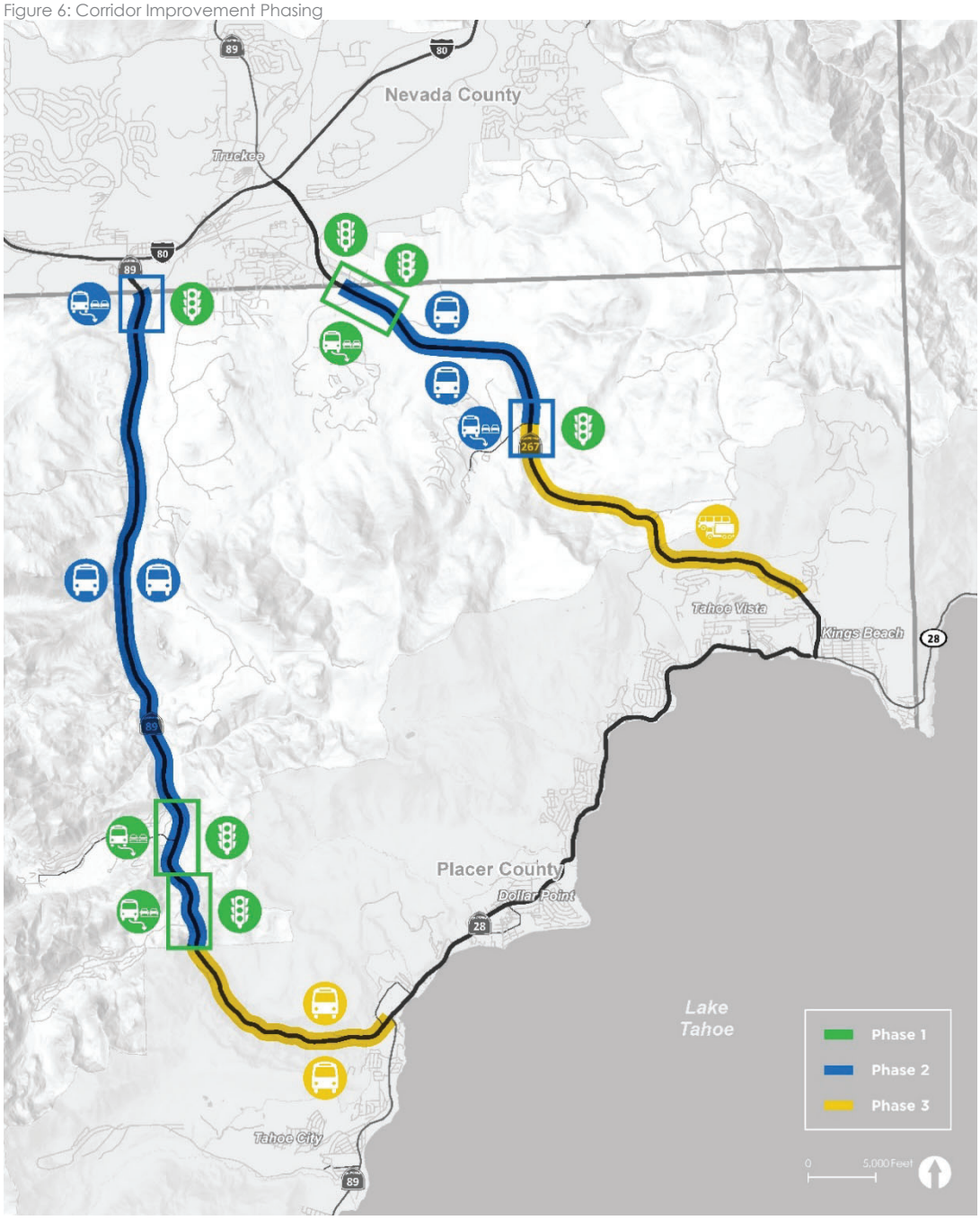
Bus/Truck Climbing Lane

A climbing lane provides an additional lane for buses, trucks, and other slow-moving vehicles to move to the right along corridors with steep grades. Climbing lanes would provide operational and safety benefits by allowing faster-moving vehicles to pass slow-moving buses and trucks, thus reducing overall average travel times along the corridor and the potential for riskier passing maneuvers by vehicles "stuck" behind slow-moving vehicles. This improvement would require additional right-of-way in order to maintain sufficient shoulder widths along the corridor. Extents for the bus/truck climbing lane will need to be evaluated in future project development stages to determine the specific start and end points of the lane to best reduce the impacts of slow-moving vehicles along the corridor.

IMPROVEMENT PHASING

The Plan corridor improvements will require additional analysis and design to move forward through the project development process and, ultimately, implementation. Based on existing conditions along the corridor, project development timelines, and the extent of any required construction, the recommended improvements will vary in their implementation timeline. The Plan includes preliminary evaluation of the SR 89 and SR 267 corridors to determine the expected feasibility of implementing improvements along the corridor and the phasing for any improvements. Figure 6 shows the corridor improvement locations and the recommended phasing for the improvements. Each phase and corresponding improvement types and locations are discussed in the following sub-sections.

Figure 6: Corridor Improvement Phasing



Source: Kittelson & Associates, Inc., 2020.

Phase 1: Near-Term Improvements

Phase 1 corridor improvements are near-term improvements that could move forward with more limited feasibility analysis, simpler design needs, and where existing conditions on the two corridors present fewer contextual constraints on implementation. These improvements could be completed within a five-year time horizon (if not sooner) upon being moved forward for implementation. The near-term improvements would require more limited right-of-way acquisition for implementation and encompass smaller study areas. Each improvement type and the locations to be considered in Phase 1 are described below. Figure 6 presents improvement types represented by icons at the approximate location of the improvement, as well as implementation phase indicated by color shading.

Transit Signal Priority Modifications

At signalized intersections along the two corridors, the feasibility of implementing signal modifications would be evaluated to provide TSP. This improvement is feasible for all signalized intersections along the corridors in Phase 1. Phase 1 TSP modifications are recommended at:

- SR 89 & West River Road
- SR 89 & Squaw Valley Road
- SR 89 & Alpine Meadows Road
- SR 267 & Northstar Drive
- SR 267 & Old Brockway Road[2] (Truckee)
- SR 267 & Truckee-Tahoe Airport Road

These modifications would require additional transit vehicle detection and potential modifications to the signals and controller equipment to allow transit vehicles priority when arriving at the intersection. This would also require retiming the traffic signals along the corridor and additional signal/detection maintenance associated with any new detection or signal equipment.

Transit Queue Jump Lanes

Selected signalized intersections along the two corridors would be evaluated to determine the feasibility of queue jump lanes to allow TART buses to "jump" congestion-related queueing. Depending on the right-turn volumes at the intersection and the desired transit movement at the traffic signal, the queue jump lane could be a modified right-turn only lane to allow bus through movements or a dedicated transit lane. Phase 1 transit queue jump lanes are recommended at:

- SR 89 & Squaw Valley Road
- SR 89 & Alpine Meadows Road
- SR 267 & Airport Road/Schaffer Mill Road

The transit queue jump lanes would require limited intersection widening to maintain shoulders and provide the dedicated transit lane(s). Signal modifications would be required to provide TSP and/or a leading transit interval.

[2] This location is within the Town of Truckee and will require coordination with the Town to implement the TSP improvements.

Source: LSC Transportation Consultants

Mid-Term Improvements

Phase 2 corridor improvements represent mid-term Plan improvements for SR 89 and SR 267 that are summarized below. These improvements would require more extensive feasibility analysis before being moved forward for implementation. Additional project development studies would likely be required and/or the recommended improvements would require more extensive right-of-way acquisition to move forward. Phase 2 improvements could be completed within a 10- to 15-year time horizon upon moving into the project development process, though some improvements may require less time if funding is available. The locations to be considered in this phase for each improvement type are detailed below.

Transit Queue Jump Lanes

Expanding on the transit queue jump lanes recommended in the Phase 1 near-term improvements, Phase 2 would implement queue jump lanes at the following locations:

- SR 89 & West River Road
- SR 267 & Northstar Drive

These improvements would be subject to the same considerations noted in Phase 1.

Reversible Bus-Only Lane

The feasibility of an improvement project to add a center-running, reversible bus-only lane along the congested and least constrained portions of the two corridors would be evaluated. The bus-only lane would provide buses a dedicated right-of-way to avoid congestion along the two corridors, reducing transit travel time delays due to queuing and congestion. At signalized intersections, the bus-only lane would build on the TSP and queue jump lanes identified above to allow buses priority at the intersection. The bus lane would be physically separated from

general-purpose lanes to help prevent illegal use of the bus-only lane. Phase 2 reversible bus-only lanes are recommended for the following segments:

- SR 89 from West River Road to Alpine Meadows Road
- SR 267 from Airport Road/Schaffer Mill Road to Northstar Drive

Roadway widening would be necessary along segments of the corridors to provide sufficient shoulders, space for safe enforcement activities, and space for disabled vehicles to pull over safely. As described above, access management strategies would need to be considered to improve safety and operations with the improvement. A range of potential access management strategies are detailed in the section above. Access management will be most critical on SR 89 where there are numerous uncontrolled intersections and access points along the corridor. The center-running reversible bus-only lane could also be explored with an alternative to consider a reversible HOV 4+ lane. This would require implementing additional safety and notification features to reduce the potential for wrong-way conflicts. As a result, the implementation of these improvements would likely require more extensive design, increase the improvement's implementation cost, and present additional impacts on the corridor.

Source: Stephen Leonardi, Unsplash

Long-Term Improvements

Phase 3 corridor improvements represent long-term improvements for SR 89 and SR 267. These improvements would require extensive feasibility analysis before being moved forward for implementation. Additional project development studies would be required and/or the recommended improvements would require more extensive right-of-way acquisition to move forward. The improvements within this phase would also need to widen the corridors in locations that are challenging topographically, would require new or upgraded structures, and, as a result, will be costlier than Phase 2 improvements. Phase 3 improvements could be completed within a 15- to 25-year time horizon upon moving into the project development process, though some improvements may require less time if funding is available. The locations to be considered in this phase for each improvement type are detailed below.

Reversible Bus-Only Lane

Expanding on the reversible bus-only lane on SR 89 above, Phase 3 would expand the SR 89 bus-only lane from Alpine Meadows Road to Tahoe City.

These improvements would be subject to the same considerations noted in Phase 2.

Bus/Truck Climbing Lane

On SR 267 from Northstar Drive to Kings Beach, the feasibility of an improvement project to add bus/truck climbing lane(s) along the mountainous segment of the corridor would be evaluated. The bus/truck climbing lane(s) would provide a dedicated lane for slower-moving buses and trucks to climb the grades along SR 267. This would require additional right-of-way along the corridor to maintain existing or sufficient shoulder widths with the additional climbing lane(s).

NEXT STEPS FOR IMPLEMENTATION

Necessary steps to realize the Plan's vision for the SR 89 and SR 267 corridors for implementation are summarized below:

- Placer County will need to coordinate closely with the Town of Truckee and Caltrans to ensure that any improvement made along the northern end of the two corridors is coordinated with plans and improvements for facilities outside Placer County's jurisdiction. Similarly, Placer County should continue to coordinate with the Tahoe Regional Planning Agency to ensure improvements within the Resort Triangle are coordinated with regional improvement strategies in the Tahoe Region.
- Any improvements along the two corridors will require close coordination with Caltrans and CHP to ensure the recommended improvements can be implemented in a manner consistent with both agencies' needs and priorities along the two State routes.
- Improvements will need to enter the Caltrans planning and project development processes. Depending on the scale and need of the improvement, this process may involve multiple levels of evaluation, alternatives analysis, environmental studies, community outreach and public input, and project design for completion.
- Funding sources for the improvements will need to be identified and programmed prior to implementation. This could take the form of grant funding or programming funds from Federal, State, or local sources.

Source: Damian Stefanakis, Kittelson

MANAGING PARKING

It is increasingly clear that implementing significant improvements in a transportation system requires a balanced approach to both non-auto incentives and auto disincentives. Simply expanding transit and bicycle/pedestrian options without changing the low cost and convenience of the private automobile in a resort area does not cause a significant overall shift in mobility patterns. While roadway tolling is a potential option, pricing and managing auto use at the end of the trip, such as at the parking space, is more widely accepted, and much easier for a county or community to implement incrementally. To achieve these goals while reflecting a balanced approach, a strong parking management element is a key part of this overall Plan.

Beyond this broader strategy, this parking management strategy is intended to accomplish the following:

- Generate funding for alternative transportation enhancements, such as non-motorized facilities and expansion of transit services
- Increase parking availability for the most convenient spaces, thereby encouraging additional economic activity and reducing the congestion created by drivers searching for parking
- Provide the best overall utilization of parking through institutional agreements and public policies
- Solve parking-related issues, such as parking activity in inappropriate or unsafe locations
- Provide landowners with options for supplying parking that can increase the feasibility of property enhancements and redevelopment

Not included in this strategy is significant expansion in parking supply within the key activity centers, as this would be counter to the goals of shifting away from auto use. Overall, the North Tahoe commercial centers have an adequate number of parking spaces, so long as management strategies can result in better use of these spaces. While parking at popular recreation sites (e.g., beaches) reaches capacity on busy days, expanding parking would only result in larger filled parking facilities, increased traffic levels, and the potential for greater overcrowding. Though reorganization and modest expansion of parking in the Tahoe City commercial core is included in this plan, the overall strategy is to better manage existing parking.

COMMERCIAL CENTER PARKING MANAGEMENT

Seasonal summer and winter paid parking programs should be established in both the Kings Beach and Tahoe City commercial core areas[3]. As detailed in Appendix III, this management strategy is based on a review of existing parking conditions and demands and of peer resort community parking management strategies. It builds upon previous work conducted in the region, including the North Tahoe Parking Study (LSC, 2015) and the Placer County Tahoe Basin Area Plan (Placer County, 2017). The recommended parameters of this plan element are as follows:

- The recommended paid parking areas are shown in Figure 7 and 8 for Tahoe City and Kings Beach, respectively. These areas generally comprise the developed commercial portions of the two Town Centers as defined in the Area Plan, along with adjacent roadways and public parking lots. Paid parking would be required for all spaces in public lots and along State[4] and County right-of-way, as well as lots owned by private entities that choose to participate in the paid parking program (as discussed below). The public spaces in these areas total 389 in Tahoe City (41 percent along the State highway, 13 percent along County roads and 46 percent in public lots) and 279 in Kings Beach (29 percent along the State highway, 24 percent along County roads and 47 percent in public lots).
- Parking fees should be enforced during the summer and winter seasons only. Example dates would be June 15th to September 15th, and December 20th to April 1st. Parking activity in the spring and fall are observed to be about one-third of that during the busy seasons, in both core areas.
- Paid parking would be implemented using payment kiosks with "pay by plate" technology, as well as through an app downloaded onto smartphones. Drivers would enter their license plan number at the kiosk (or through the app), along with the desired length of stay. This has several advantages: (1) enforcement is aided by use of License Plate Recognition (LPR), (2) individual spaces need not be defined (and maintained) through striping, (3) the visual clutter and increased maintenance costs of individual parking meters is avoided, and (4) drivers do not need to return to their car to leave a receipt on their dash. Payment at the kiosk by credit card and by coin is recommended, as bill acceptors significantly increase maintenance needs and are often out of service.
- Fees of $1.50 per hour along SR 28 and $1.00 per hour elsewhere are recommended. These rates are consistent with those of peer communities and are high enough to generate revenues and travel mode shifts without unduly impacting customer levels. This differential would help to increase availability along the State highway, encouraging additional customer parking. Increments as small as 15 minutes (25 cents off the State highway) would aid short stops. Fee schedules that increase with duration could also be considered; for example, a fee of $1 per hour for the first two hours and $2 per hour for subsequent hours. This would encourage additional shifting of longer-term parking (e.g., day-use beachgoers) out of the paid parking areas. However, it would also complicate the "messaging" of the paid parking program.
- Time-limited parking restrictions are not recommended for several reasons. Primarily, time limits do not substantially encourage a shift to other travel modes, but rather simply shift parking activity within an area. They can be perceived as imposing more regulation on employees and other residents, while not impacting visitors making short duration stays. Timed parking also is a net drain on County coffers, as typically the cost of enforcement exceeds the fine revenues. In addition, timed parking can increase traffic congestion as longer-term parkers (e.g., employees) shuffle their cars to avoid fines.

[3] It will be important for programs to be implemented in both key commercial districts, in order to aid in motorist's ability to learn and use the systems as well as to avoid any disparate impacts.

[4] There is precedence for local paid parking programs on California State highways, such as SR 123 (San Pablo Avenue) in Oakland and Berkeley and SR 44 in Redding.

Figure 7

Tahoe City Parking Management
Placer County, CA

Figure 8

Kings Beach Parking Management
Placer County, CA

- While the program should provide a modest level of incentive for employees to consider alternative travel modes, it should provide a significant break in costs for employees. Employee permits should be available at recommended rates of $200 per year, $40 per month, or $2 a day. The daily rate could be paid through the app or kiosk, valid only for license plates assigned to registered employees. Employee parking rates would not be valid for parking along SR 28. The trip reduction ordinance discussion below provide additional strategies to encourage alternative mobility options among employees.
- A mobile parking app would be developed and made available, with the following features:
    - Online payment ability, either through calling a number to pay or by setting up an account
    - The ability to reserve parking spaces in participating private lots by license plate
    - The ability to provide driving directions to the parking facility (rather than the activity center)
    - The ability to provide a credit for visitors using the app, as a form of validation
    - The ability to provide parking at discounted rates (potentially significantly discounted) for local residents and employees
- As residential neighborhoods are adjacent to both commercial core areas, Residential Parking Permit (RPP) areas will need to be established to minimize the potential for overflow parking impacting residents. Potential residential parking program areas are also shown in Figures 7 and 8, above. These areas are defined as those within a 3- to 5-minute walk (approximately ¼ mile) of the paid parking areas and with a strong likelihood of impact from motorists attempting to avoid the paid parking areas. In Tahoe City, this consists of the areas north of Tahoe Street along Jackpine Street, Red Cedar Street, Pioneer Way and Grove Street, as well as nearby portions of Bunker Drive and Fairway Drive. In Kings Beach, this area consists of the "grid" streets within roughly three blocks of the paid parking area, as well as the nearby portions of Brassie Avenue and Beaver Street. Note that residents of dwelling units within the paid parking areas would also participate in the residential parking programs. This program would have the following characteristics:
    - Parking permits (hangtag or sticker) would be available upon proof of residency (e.g., a recent utility bill).
    - Guest parking permits would be provided to residents in the parking area (e.g., two per household). Additional guest parking could be accommodated through an online request process.
    - Signage would be needed along streets in the residential areas. At a minimum, signs are required at all entrances to the residential parking permit area.
    - Existing winter parking restrictions would remain in effect.
    - The administration and convenience of the RPP should be improved by allowing much of the process to be completed online. For instance, visitor permits and residential permit renewals can be accomplished online.
- A "parking ambassador" approach is recommended for enforcement. This provides a relatively lenient application of parking regulations, such as providing a reasonable level of "grace time." Staff would be hired and trained with an educational approach rather than a strict enforcement approach. LPR technology should be employed for parking monitoring and enforcement. This would allow for faster enforcement and greater flexibility in reserving parking (by plate) and implementing employee parking programs.

Source: LSC Transportation Consultants

Private Parking Participation

The benefits of a paid parking program in the commercial core areas should be enhanced through the voluntary participation of private parking lot owners in the comprehensive paid parking program. In Tahoe City, 63 percent of the parking spaces are privately owned, while in Kings Beach 50 percent of the parking spaces are privately owned. As a result of use limitations, many of these lots have excess capacity during periods of busy parking demand.

Advances in technology provide a high degree of flexibility for private participation in a public parking program. As an example, the City of Sacramento's parking program (SacPark) includes over 40 private participants in the downtown Sacramento area. While many of these are strictly parking lots or structures (which are not pertinent to the Tahoe Region), they also include office buildings and hotels with on-site parking. The SacPark program allows these private firms to decide on a day-to-day and hour-by-hour basis how many parking spaces would be available for the public. A hotel operator, for example, may make 20 spaces available on a day when an on-site conference is in session, but 100 spaces when occupancy is lower. Drivers can then reserve one of these spaces by providing the license plate and payment information through the app. The SacPark program then provides 85 percent of the revenue to the private owner, retaining 15 percent to help pay for administration, monitoring, signing, and branding. This approach avoids the need to designate a specific number of spaces in a private facility for public use and provides much greater flexibility to match the large variations in private parking needs in the Tahoe Region.

The following are examples of possible private parking collaboration opportunities:

- America's Best Value Inn in Tahoe City has 93 parking spaces, directly across SR 28 from the popular Commons Beach. In the busy summer period, counts indicate that at least 36 of these spaces are not used between 10 AM and 6 PM, when beach parking demand is highest.

- Similarly, counts conducted at the Kings Beach Safeway show at least 60 available spaces over the prime hours of beach activity at the nearby North Tahoe Beach.
- The Tahoe Lake School has approximately 50 spaces in their lower lot within a convenient walk distance of the Tahoe City commercial core; these spaces are largely unused during the busy summer season.

In addition, Placer County is currently working with private land owners and the Tahoe City Public Utility District to assess the potential to combine parking facilities and expand the Grove Street public lot behind the commercial buildings along the north side of SR 28 between the Cobblestone Center on the west and Grove Street on the east. As detailed in the *Tahoe City Mobility Plan* (Placer County, 2016), this will provide an expansion of approximately 68 parking spaces, much of it through better utilization of existing pavement; reduce the need for circulation movements on and off of the State highway; improve the pedestrian environment through closure of a driveway and reduced auto conflicts; and move truck deliveries out of the State highway. This would provide an excellent opportunity for private/public partnership on parking solutions.

Costs and Revenues

The potential revenues that could be generated from the commercial core parking programs (excluding any participation by private landowners) was estimated based on the annual revenue per space generated by the Truckee paid parking program, the relative activity by season, and the assumptions that a North Tahoe program would be limited to summer and winter only and that winter parking on County roadways would continue to be prohibited. As shown in the following table, the parking revenues generated by paid parking programs in Tahoe City and Kings Beach would total approximately $1.03 million per year.

Commercial Core Parking Management Costs and Revenues

	Annual Operating Revenues	Annual Operating Costs	Net Annual Revenues	Capital Costs
Tahoe City Commercial Core	$648,000	$291,000	$357,000	$436,000
Kings Beach Commercial Core	$384,000	$267,000	$117,000	$309,000
Total	$1,032,000	$557,000	$474,000	$745,000

Annual program operating costs are estimated to be approximately $557,000, including enforcement staff, administration staff, kiosk maintenance, marketing, vehicle operating, software and credit card fees. Subtracting annual operating costs from total parking revenues, a paid parking program encompassing the Tahoe City and Kings Beach commercial core areas have the potential to generate approximately $474,000 per year.

The number of kiosks necessary to provide one within reasonable walking distance of all paid parking spaces (based on standard practice seen in the peer communities) would be approximately 31 in Tahoe City and 16 in Kings Beach, for a total of 47. At a typical cost (installed) per kiosk of $10,000, this requires $470,000 in funding for purchase and installation. Other capital costs would be incurred for signage, one vehicle in each area, LPR equipment, and initial development of the parking app. Including these additional items (and assuming existing County office space is available for the parking staff), total capital costs are estimated to be about $745,000.

Considering parking revenues versus capital and operating costs, over a 20-year period, this overall program could generate $6.0 million in net revenues[5]. For public acceptance of the program, it will be important that these net revenues be invested locally, particularly in strategies that improve mobility to offset the perceived impacts of paid parking on auto access. This could include expansion in transit services (e.g., microtransit programs), new bicycle/pedestrian facilities, and enhanced maintenance of bicycle, pedestrian and transit facilities.

Paid parking in the commercial cores would generate $6.0 million in funds over 20 years that could go towards alternative transportation improvements.

Source: Amanda Leahy, Kittelson

Other Commercial Core Parking Policies

Provide Parking Flexibility to Encourage Non-Auto Mobility Options and Encourage Redevelopment

Historically, parking regulations in the Resort Triangle area have focused on traditional requirements for property owners to provide sufficient private on-site parking supply (a "parking minimum" approach). This has proven to result in effectively encouraging auto use by accommodating peak parking demands, while also resulting in

[5] Total net revenues, considering episodic replacement of vehicles, kiosks, and signage

inefficient land use due to an overall oversupply of parking. It has also raised barriers to the redevelopment of the North Tahoe commercial centers (developed prior to the automobile), particularly as the small size of parcels often effectively prohibits on-site parking. Fortunately, the 2017 Tahoe Basin Area Plan introduced some strategies to expand beyond on-site parking minimums, such as parking reductions in areas with high non-auto accessibility, payment of fees towards public parking in lieu of onsite parking, and reductions in parking requirements reflecting efforts to support non-auto mobility options. It is recommended that these options be expanded in the following ways:

- **Reductions in parking requirements associated with ongoing transit operating funding support** -- Placer County has in recent years established "Zone of Benefit" fees on developments to generate ongoing annual funding for transit operations. Reductions in parking requirements associated with payment of these fees should be considered reflecting the associated reduction in auto use, along with possible expansion to fund ongoing costs of non-motorized facilities.
- **Public subsidy of parking in lieu fees** -- While the parking in-lieu fee option provides another option to reduce the need for on-site private parking, traditionally this fee has been pegged to the cost of providing a public parking space. The high cost of providing public parking in the Tahoe Region can make this strategy financially infeasible, particularly for smaller developments. Placer County could consider subsidizing (or reducing) this fee level so that redevelopment is encouraged while still requiring an individual developer to help contribute to addressing their parking impact on the community.
- **Reductions in parking requirements for small projects** -- Small projects (such as redevelopment of a single commercial lot in Kings Beach) typically would generate a small parking need that can be accommodated by the overall excess community parking supply, particularly as paid parking efforts reduce parking demand. Consideration should be given to reducing or eliminating parking requirements for small projects, such as exempting the first ten parking spaces required by an individual development. Parking strategies (including new parking supply) for larger developments could be identified through preparation of a Parking Management Plan.

The implementation of active parking management will, over time, shift parking demands. As a result, existing regulations (as codified in the Tahoe Basin Area Plan implementing regulations) should be periodically reviewed to ensure that they reflect current parking conditions.

Unbundled Parking

"Unbundled parking" is the practice of offering on-site parking separate from residential units. Rather than providing parking as part of the rental or sale of a residential unit, the economic decision to obtain a parking space is made separately. This gives residents the ability to gain the monetary benefit of deciding to limit their vehicles to one, or even to have no vehicle at all. Recent research has suggested that unbundled parking methods can reduce vehicle miles travelled by 3 to 13 percent.[6] This is recommended as another step towards a more multimodal transportation future for the Resort Triangle.

One of the critiques of unbundled parking is that it could lead to parking on nearby public streets. However, if implemented in tandem with the paid parking and neighborhood parking management strategies recommended above, this would not be an issue in the North Tahoe area.

[6] Quantifying Greenhouse Gas Mitigation Measures, California Air Pollution Control Officers Association, 2010.

Source: Wil Stewart, Unsplash

Implementation Steps

Establishing a paid parking program is a large and complex task. Key steps of implementation consist of the following:

- Establish a "Parking Working Group" as an ongoing forum for collaboration and decision making. This should include key County staff (Public Works, Community Development and Board of Supervisors staff members), members of the North Tahoe Business Association, Tahoe City Downtown Association, and the public (e.g., North Tahoe Regional Advisory Council members). It would also benefit from input from other organizations, such as the North Lake Tahoe Resort Association, State Parks, Tahoe City Public Utilities District, North Tahoe Public Utilities District, Caltrans and California Highway Patrol.
- Hold initial public workshops in both Tahoe City and Kings Beach to discuss concepts and investigate possible refinements
- Hold workshops with private property owners to present information on possible private participation in the program
- Establish an agreement with Caltrans regarding paid parking implementation and maintenance/snow removal on SR 28
- Conduct a focused study regarding whether parking management and/or enforcement services should be provided in-house with County staff or through private contractor(s)
- Evaluate specific technology options regarding parking kiosks and app capabilities. Through Request For Proposals processes, select vendors of hardware and software development services.
- Prepare detailed construction plans defining parking kiosk locations, utility requirements, and signage
- Develop a marketing plan. A single parking brand should be defined. Optimally, a single parking management brand and strategy would be developed for the entire Tahoe Basin. However, this would require coordination

with many stakeholders and may not be possible in a timely manner. At a minimum, consistent branding and strategies within the Placer County portion of the Tahoe Region should be a goal. Other elements of the marketing strategies should include traditional media, social media, website, and disseminating information through existing organizations (e.g., business associations).

- Enact the necessary revisions to the Placer County Code. At present, the Placer County Code does not address paid parking regulations and enforcement, though Section 10.12 Part 8 does define the ability to establish permit parking in residential areas.
- Add the necessary positions to County Public Works staff and fill these positions
- Establish a parking fund within the County budget process. Jurisdictions typically establish a separate fund to track parking expenses and revenues and to have publicly accessible records of how revenues are allocated to projects in the local area.
- Install equipment and signs, and systemwide testing

Implementing parking management will also warrant a review of the Tahoe Basin Area Plan transportation strategies, and the associated implementing regulations. At the start, regulations will need review to reflect paid parking and the unbundling of parking. Over the longer term as parking demand patterns change with parking management, the policies and standards in the Area Plan should be reconsidered to ensure that they are consistent with current mobility goals.

A realistic schedule for implementation is 18 to 24 months. One possible implementation strategy would be to establish the program for summer only, expanding to winter after initial operational issues are worked out.

Source: LSC Transportation Consultants

Monitoring Program

In the first few years of the program in particular, it will be important to monitor the effects and driver behaviors associated with this parking management program, and to use this information to refine the program. One element of a monitoring program is maintaining a parking complaint log that details issues identified by the public and steps taken to address those issues found to be valid. Also, the following data should be collected:

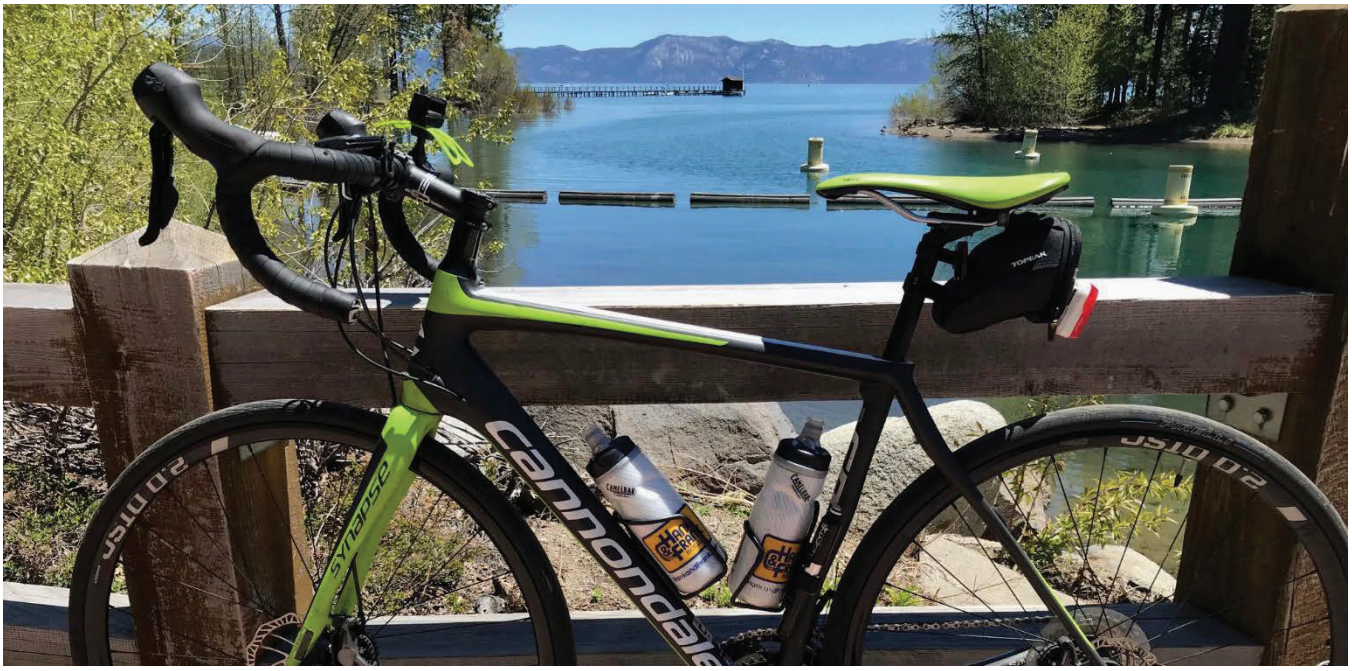
- Parking occupancy counts over the course of a peak day and off-peak day.
- Parking turnover analysis
- Observations of parking in private lots and nearby residential areas
- Survey of businesses
- Summary of the parking complaint log
- Summary of transactions and revenues by location (including app vs. kiosk), length of stay, day and hour
- Summary of enforcement (citations, type of violation, citation revenues)
- Evaluation of year-to-year trends in the data

At the end of each season, this data should be summarized in parking monitoring reports, including the data and analysis, discussing changes in the program from previous years, and providing recommendations for improvement in the parking program.

Benefits

The parking program discussed above would have the following benefits:

- It would provide a direct disincentive for auto travel to the commercial core areas, thereby increasing the potential for travelers to consider alternative travel modes. Travelers with a relatively high potential to shift modes include residents living or visitors staying within a convenient walking distance (e.g., ¼ mile) or a convenient bicycling distance (e.g., 3 miles) of the commercial core areas. In addition, there are many more residents and visitors in areas with convenient transit options. At present, everyone along the SR 28 corridor between Tahoe City and Crystal Bay is provided free transit service every half hour during the day to both Tahoe City and Kings Beach (with free hourly service in the evening as well as free hourly service from other corridors). Future expansions in transit service (e.g., microtransit programs in the two communities) could also significantly expand the potential shift to transit. The literature regarding studies of traveler response to paid parking in recreational areas is limited but indicates the potential to shift travel modes by 5 percent to 10 percent.
- It would generate significant revenues ($21.1 million over 20 years) that could be used to fund a variety of mobility benefits, including the expansion of public transit options, better long-term maintenance of parking facilities, bicycle/pedestrian facilities, and transit facilities; expansion of bicycle and pedestrian facilities; traffic control programs; and traveler information systems.
- It would provide a mechanism by which day visitors (who currently contribute little to the local public revenues) would begin to generate funding for public improvements.
- Experience in other communities indicates that it would improve parking availability in the most convenient spaces, increasing convenience for customers.



Source: Damian Stefanakis, Kittelson

SUMMER RECREATIONAL PARKING MANAGEMENT

A paid parking program at summer beach and recreational parking areas is recommended. Parking is an issue at virtually all beaches along the Placer County shoreline and the 64-Acre Parcel trails access, and paid parking could encourage alternative means of travel while generating funding to expand alternatives access options. Paid parking at beaches is the general rule around the lake, with exception of the Placer County portion.

The sites considered to be feasible for summer recreational paid parking management are those with a sufficient number of spaces to warrant the costs of kiosks (and their maintenance) and the costs of staff time for enforcement, and that have sufficient peak summer parking demand. As shown in Figure 9, recommended paid parking locations includes a total of 381 spaces and consists of the following:

- 64 Acres Recreation and Transit Center – A total of 229 parking spaces in the US Forest Service (USFS) lots, along the portion of SR 89 soon to be conveyed to Placer County and in the Tahoe City Transit Center lot
- Commons Beach – 44 parking spaces in the beachfront lot (included in the Tahoe City Commercial Core parking management area)
- Carnelian Bay/Patton Landing – This California Tahoe Conservancy site has 22 spaces in the on-site lot and 18 on-highway parking spaces in front of the property. Nearby parking along Carnelian Woods Avenue and Onyx Street should also be included.
- Tahoe Vista Recreation Area Highway Parking Spaces – There are approximately 35 (currently unstriped) parking spaces along SR 28 that are used by persons avoiding the existing paid North Tahoe Public Utility District (NTPUD) lot.
- Moon Dunes Beach – On-highway parking spaces with capacity for 26 vehicles
- North Tahoe Beach – 36 parking spaces within the existing lot (included in the Kings Beach Commercial Core parking management area)

Figure 9 Beach Parking

Other possible beach parking sites, such as Skylandia Park and Speedboat Beach, do not have sufficient number or configuration of parking spaces to result in an effective parking program (though existing parking restrictions would remain in place and enforced) This list also does not include the Kings Beach State Recreation Area, which already has a paid parking program.

The recommended elements of a Summer Recreation Parking Program are as follows:

- Consistent with other beach parking sites, a flat fee would be charged. The current rates for the Kings Beach State Recreation Area are appropriate: $10 per day, and $5 for parking after 5 PM.
- Paid parking would only be enforced during the summer months (i.e., mid-June through mid-September).
- Parking enforcement would be provided between roughly 10 AM and 7 PM (with a lunch break). One staffer could cover roughly three daily rounds of enforcement at the five sites.

Similar to the commercial core parking programs, a parking fee program on recreational sites would provide a substantial incentive to shift from auto travel to non-auto modes. While day visitors to Tahoe would probably not shift travel mode significantly, there is a substantial proportion of North Tahoe Placer County residents and overnight visitors that are within a convenient walking or bicycling distance of the six sites. Most sites have convenient multipurpose paved trails or low-volume streets providing good connections to nearby neighborhoods. In addition, each of the six sites is conveniently served with half-hourly free TART service.

Costs and Revenues

Based on the existing fee level and utilization rate of the Kings Beach State Recreation Area, and considering the relative level of parking activity at the future potential sites, a parking fee program over all six sites would generate around $909,000 per year. Parking fees near the Tahoe Vista Recreation Area could also boost use and revenue at the nearby North Lake Tahoe Resort Association-operated fee lot. Annual operating costs would equal roughly $181,000 per year, including enforcement, administrative, marketing/software, vehicle operating costs, meter maintenance, and credit card fees. There is potential for some cost savings if commercial core parking staff also conduct some of the beach parking enforcement. This would yield a net revenue of $728,000 per year.

Summer Beach Parking Management Costs and Revenues

	Annual Operating Revenues	Annual Operating Costs	Net Annual Revenues	Capital Costs
Total	$909,000	$181,000	$728,000	$388,000

Capital costs would total roughly $388,000, including purchase/installation of 28 meters, signage, one vehicle with LPR capabilities, and the mobile app/payment setup.

If both beach parking and commercial core parking programs are implemented, it would be necessary to consider how the management of the recreation parking sites within the commercial core areas would be coordinated. There could be potential operating cost savings as some staff are able to provide enforcement on both programs. Marketing and app development could also be combined and enhanced.

This program would generate roughly $728,000 per year in net operating revenues. Over a 20 year period and including initial and recurring capital costs, it would generate aproximately $13.1 million that could be used to fund a variety of other parking improvements and mobility benefits, including the following:

- Expansion of public transit services
- Better long-term maintenance of parking facilities, bicycle/pedestrian facilities, and transit facilities
- Expansion of bicycle and pedestrian facilities
- Summer traffic control programs
- Traveler information systems

It should be emphasized that fees on recreational sites in Placer County would bring the area more in line with beach parking policies in other portions of the Tahoe Basin, where fee parking is common.

Implementation Steps

A key first step in implementing beach parking management is coordination with public recreation land managers. Optimally, a coordinated and comprehensive management program is the goal in order to provide a consistent message to summer recreational motorists. Implementation challenges would vary between the individual sites:

- The 64-Acre parcel is owned by the USFS. Parking revenues are typically returned to the USFS Region, and negotiations would be needed for revenues to stay in the local area. Paid parking at the Tahoe City Transit Center parking area may also be considered to be contrary to its purpose as a park-and-ride facility, though this could be addressed through a validation program.
- Paid parking on the shoulder spaces at Patton Landing, Tahoe Vista Recreation Area, Moon Dunes Beach and North Tahoe Beach would require coordination with Caltrans.
- The Patton Landing and North Tahoe Beach lots are owned by the California Tahoe Conservency, which would require negotiations. The Patton Landing site also includes the "Watermans Landing" café and paddleboard rental, which may warrant a customer validation strategy.

Other implementation steps would be consistent with those discussed above regarding commercial core parking programs. Combining individual implementation steps between the recreational parking and commercial core parking (e.g., a single contract for equipment installation) could reduce overall costs. An 18- to 24-month implementation schedule would be realistic.

Monitoring Program

An ongoing monitoring program will be important to the long-term success and public acceptance of the program. A parking complaint log should be maintained, detailing issues identified by the public and steps taken to address the issues. Also, the following data should be collected:

- Parking occupancy counts over the course of a peak day and off-peak day
- Parking turnover analysis
- Observations of parking in private lots and nearby residential areas
- Summary of the parking complaint log
- Summary of transactions and revenues by location (including app vs. kiosk), length of stay, day and hour
- Summary of enforcement (citations, type of violation, citation revenues)
- Evaluation of year-to-year trends in the data

This data should be summarized in an annual parking monitoring report and used as the basis for recommendations to improve the parking program.

Benefits

A summer recreational parking program would have the following benefits:

- It would provide a direct disincentive for auto travel to recreational areas. In particular, the many persons living or lodging within a convenient walking or biking distance of the beaches, along with those living or lodged along the TART routes, would be encouraged to consider other modes.
- It would generate significant revenues ($14.6 million over 20 years) that could be used to expand mobility options, including additional public transit options, expansion of bicycle/pedestrian facilities (and improved maintenance), traffic control programs, and traveler information systems. Importantly, it would start to generate significant funds from recreational day visitors that currently contribute little to the region.
- It would help to control inappropriate parking near popular beaches.

Source: Mark Heisinger, Kittelson

WINTER RECREATIONAL PARKING MANAGEMENT

Recreational parking for winter activities differs from that for summer activities, as the large majority of parking for winter recreation (specifically downhill skiing/snowboarding) is privately owned. A public/private collaborative approach is therefore appropriate in defining and implementing parking management strategies to achieve winter mobility goals.

Winter resort parking management – combined with transit expansions – can together significantly address winter traffic issues.

The prevalence of free parking at the major downhill resorts is a clear factor in regional roadway congestion on busy ski days. As a largely "drive-up" (as opposed to a "fly-in") market, a very large majority of Tahoe area skiers arrive with a car. Absent parking fees (or road tolling) and given that transit buses experience the same level of traffic delays as private vehicles, skiers currently have very little incentive to shift away from driving to the resorts. Experience with transit shuttle efforts to date has shown that it is only on the limited number of days when parking at the resorts reaches capacity that there is substantial skier demand for transit access to the resorts among skiers with access to a car.

Winter resort operators are increasingly understanding the role that parking strategies can play in managing a major resort and improving overall guest experience. As evidenced by successful resorts without free unrestricted parking (e.g., Aspen Mountain, Vail, and Brighton Resort), paid parking is compatible with a resort's positive bottom line. Tahoe resorts have already made significant steps towards parking management, including the paid parking at Northstar California's village lots, the substantial carpool parking area (3+) at Squaw Valley Ski Resort and Alpine Meadows Ski Resort, and the paid parking and carpool parking (4+) at Homewood Mountain Resort.

Expanded parking management at the Resort Triangle's winter resorts could take several forms:

- Expansion or implementation of paid parking. This could be tailored to specific peak days, specific hours of the day, or variations by occupancy.
- Expansion of carpool parking capacity and/or increasing the existing 3+ carpool parking to 4+
- Establishing a paid parking space reservation system

It will be essential that there be parallel strategies to expand non-auto – specifically transit – capacity to the resorts. As discussed elsewhere in this report, this should include the following elements:

- Expanding transit capacity and convenience through more frequent service along SR 89 and SR 267. Note that some of the funding for this expansion could be generated through the parking fees.
- Expanding intercept parking capacity at intercept locations. While, optimally, skiers would be able to conveniently walk to the expanded transit services under optimal conditions, in reality, the dispersed land use pattern in the Tahoe and Truckee regions (e.g., the expansive Tahoe Donner area) means that most skiers must start their trip in their car and transfer to transit service. Good potential peak ski day intercept parking opportunities exist at the Truckee Tahoe Airport, existing school lots in Truckee, the 64 Acres in Tahoe City (both the transit center and the summer recreation USFS lot), and the Kings Beach State Recreation Area in Kings Beach.
- Providing travel time reductions for transit through bus or bus/HOV lanes, transit signal priority, and/or transit jump queue lanes at signalized intersection. This also reduces transit costs by speeding up service.

In summary, solving winter recreational congestion issues is a matter of demand and supply. The private sector resorts can address the demand side of the equation through parking management (e.g., carpool parking and paid parking) to increase the demand for transit services. The public sector's role is on the supply side – expanding intercept parking capacity and expanding transit capacity/convenience. By addressing both sides of the equation, a collaborative approach can result in a true shift in access patterns as well as better recreational experiences.

MICROTRANSIT

To support regional goals of reducing congestion and single-occupancy vehicle trips, Placer County and key stakeholder groups endorse a multimodal transportation approach. Microtransit service along the SR 28 corridor is one tool to encourage residents, visitors, and employees to 'park once'[7] and use transit rather than vehicles to travel to and from town centers and key destinations.

The following section provides microtransit service planning guidance – from route selection to details about design and phasing. Recommendations are based on national precedents and consultant expertise. For example, specific to the Tahoe Basin, the Mountaineer, which runs between and within Squaw Valley and the Alpine Meadows ski area, is a convenient transportation option for those interested in traveling without a vehicle. Similar to rideshare, customers request a trip through their smartphone app. In 2018, the service saw more than 81,000 passengers and 9,000 downloads of the service's mobile app. It is estimated that the service removed at least 20,000 vehicle trips from local access roads.

Future microtransit service will incorporate the Mountaineer's successful design features, including managing service through an on-demand based app and outfitting shuttles with racks and storage space to support recreational activities. Other research suggests that successful service in this area should be fare-free, ADA accessible, and with readily available route and schedule information. This chapter presents recommendations for proposed service areas, implementation and design details, future considerations, and next steps.

PROPOSED MICROTRANSIT SERVICE AREAS

Microtransit service is recommended along SR 28, between Kings Beach and Tahoma. The proposed service areas are defined by four key factors:

- Density - An analysis of rooftops per square mile was conducted to estimate housing density along SR 28.[8,9] The densest communities are Kings Beach, Dollar Point, Tahoe City, and Sunnyside.
- Walkability - A walkable town center is often a prerequisite for successful transit. As such, walkable town centers along the corridor anchor each of the proposed service areas.
- Key destinations – Places that residents, employees, and visitors frequently travel to and from were taken into consideration to set service area boundaries (e.g., residential neighborhoods, town centers, and lakeside recreation, campgrounds, and parks).
- Response Time - Services area boundaries were set to guarantee a 15 to 20-minute response time to and from key destinations.

[7] Park Once – A parking management approach to encourage people to drive, park, and then travel by foot or by transit to key destinations
[8] Data was acquired from the Placer County GIS department.
[9] Rooftops per square mile can account for density gaps missed in a traditional demographic density analysis using census data

The following table proposes four microtransit service areas that fit the abovementioned criteria. As noted, service areas include walkable town centers, residential neighborhoods, and popular recreation spots. At peak, between four and six vehicles are required per zone to ensure 15 to 20-minute response times.

Proposed Service Areas for Microtransit

Service Area	Extents	Key Destinations			Time of Year	Service Area
		Walkable Town Center	Residential Neighborhood	Recreation		
1	**Dollar Point – Sunnyside**	Tahoe City	Dollar Point; Talmont[1]; Sunnyside	North Tahoe School & High School; Tahoe State Recreation Area; Burton Creek State Park; Lake Forest Campground; Granlibakken	Year-round	
1	**Brockway – Cedar Flat**	Kings Beach	Cedar Flat; Carnelian Bay, Tahoe Vista; Brockway	Beaches along Route 28	Year-round	
3	**Tahoe City – Homewood**	Tahoe City	Talmont; Sunnyside; Timberland; Talmont; Homewood	Granlibakken; Kaspian Campground;	Seasonal (at onset)	
4	**Tahoe Pines-Tahoma**	Tahoma	Tahoe Pines; Homewood; Chambers Lodge; Tahoma	Sugar Pine Campground; Homewood	Seasonal (at onset)	

Source: Damian Stefanakis, Kittelson

Implementation Details

Service areas will be launched in phases, introducing and acclimating locals and visitors to service in high-demand areas before expanding the program to smaller, more seasonal communities. Unlike traditional fixed-route transit, it is easier to implement microtransit in sections because service areas can operate independently of one another. The proposed phasing introduces one service area per year.

- **Phase 1: Dollar Point - Sunnyside (Service Area 1):** The Dollar Point to Sunnyside service area is a densely populated corridor, frequented by residents, visitors, and employees traveling to key destinations. High ridership projections make the service area a viable option for a pilot, and it is likely that service could operate year-round. At peak, six vehicles would be required to ensure a response time of 15 minutes.
- **Phase 2: Brockway – Cedar Flat (Service Area 2):** Upon successful implementation of one service area, a second zone would be added based on the same parameters: density, walkability, key destinations, and response time. Brockway to Cedar Flat (Service Area 2) is a strong candidate; however, if ridership levels are uncertain, it will be prudent to trial a shorter route to avoid unnecessary costs.
- **Phase 3: Tahoe City – Homewood; Tahoe Pines to Tahoma (Service Area 3 and 4):** If funds are available, Placer County staff could consider adding microtransit service south of Tahoe City, where the population tends to be more seasonal. It will be important to coordinate closely with community members to make sure that a neighborhood shuttle suits residents' and visitors' travel needs.
- **Note**: From day one, the operation must be supported by robust marketing and branding efforts. The performance needs to be reliable, and the loading needs to be comfortable.

Design Details

While each service area has particular characteristics (e.g., unique boundaries, annual versus seasonal service, and specific hours of operation), the following design features are recommended for all service areas:

- **Fare-free service.** Microtransit service should be fare-free to incentivize residents and visitors to park once and take non-driving options to and from key destinations. A free system would be an invitation for new users to try transit and eventually ride the existing TART system as well, which currently operates as a fare-free system.
- **Shuttles are properly equipped.** Shuttles need be convenient; locals and visitors are more likely to leave their cars parked if they are able to travel with their recreational gear. As such, all shuttles should be outfitted with bicycle and ski racks and ample storage to serve users. Moreover, shuttles need to be ADA accessible and equipped to handle varied terrain and weather.
- **Implement on-demand service.** Typical wait times for a shuttle ride should be between 15 and 20 minutes, maximum. The transit experience is further improved when real-time reservations can be made through a mobile-based app to prevent overbooking. Door-to-door service should occur when and where possible; however, it might be challenging in town centers or under inclement weather conditions. In these scenarios, a user should be notified that the pick-up location has been adjusted through the mobile app.
- **Include real-time location data and dynamic schedule updates through a mobile-based app.** The Mountaineer and other successful on-demand shuttle services notify users of seasonal, holiday, or event-based service interruptions. This feature is essential, particularly at the launch of a program when service area maps are subject to change based on ridership demands.

The following table shows examples of vehicles appropriate for microtransit service in Tahoe. Vehicle selection should be informed by potential ridership demand and capacity needs.

Shuttle Options				
Vehicle Type	**Capacity**	**Examples**	**Price per capital**	**Commercial license required?**
GEM	5		$15,000-30,000	No
Cutaway	14 – 22		$100,000	No (under 15 people)
Small Bus	25 – 30		$450,000	Yes

Cost and Financing Considerations

Based on the abovementioned parameters, the annual cost of operating one service area will be about $1.15 million. This estimate considers that it would take 13 to 14 drivers (two shifts) to ensure 15 to 20-minute response times during a long service day. (E.g., 6 a.m. to 12 a.m.) However, costs can be trimmed by starting with a smaller service area, or shorter service hours, so only one shift of drivers is needed. (E.g., 9 a.m. to 6 p.m.). Alternatively, there is an option only to operate seasonal shuttles. Seasonal shuttles would be out of service for part of the year when there is minimal to no demand.

The pace of implementation depends on available funding. Upon confirming a service area for the Phase 1 pilot, the Placer County team will conduct a financial feasibility study and verify funding sources. As mentioned above, if funding is constrained, the agency should consider implementing a smaller service area for the pilot. As ridership demand increases, the project team may look to other funding streams. For example, revenue collected from the parking management program could feasibly fund operations and capital expenses.

Cost Estimates for Microtransit				
	Annual		Seasonal	
	Shorter Hours of Service	Longer Hours of Service	Shorter Hours of Service	Longer Hours of Service
Annual Operating Cost Estimate	$580,000	$1.15 million	$170,000	$340,000

BENEFITS AND ITEMS TO BE REFINED

Microtransit along the SR 28 corridor will be designed and implemented to benefit a variety of user groups – visitors, residents, and employees. However, as shown in the figure below, each user group will likely value the service differently. For example, a key benefit to visitors would be fare-free service to recreation destinations, while residents and employees may also appreciate improved connectivity to existing TART service. As such, marketing and branding campaign strategies should speak to multiple user groups.

	Key Benefits and Considerations, by User Group							
User Type		Key Benefits for Successful Service						
	Free and convenient	Reduces visitor congestion	First and Last Mile Connections	Fills gaps in TART service	Dependable service	Storage space	Lively branding	Commuter benefit
Visitors	X		X	X	X	X	X	
Local Residents	X	X	X	X	X	X		X
Employees	X	X	X	X	X	X		X

PARTNERSHIPS AND NEXT STEPS

Piloting a microtransit program will require coordination across several agencies. While Placer County staff will take the lead on planning and implementation, other organizations would be needed to support the project. The following figure provides a high-level overview of the expected roles and responsibilities, by agency.

Roles and Responsibilities by Agency

Agencies	Role	Responsibilities
Placer County	Lead	Placer County will be the lead agency, planning and implementing microtransit in the Tahoe Basin. The role will require in-house service engineering and planning and managing consultants and partner organizations.
Tahoe Regional Planning Agency (TRPA)	Support	TRPA will provide a regional perspective and support coordination among the various towns and key destinations.
Tahoe Truckee Area Regional Transit (TART)	Support	TART will be available to identify coordination opportunities, schedule considerations, and other logistics support.
Environmental Organizations: (Tahoe City Conservancy, Sustain Tahoe)	Advisory	Placer County staff will seek continued feedback from environmental organizations to have coordinated conversations about improving the region's sustainability as it relates to this effort and the broader Resort Triangle Transportation Plan.
North Tahoe Business Association, Sierra Business Council	Advisory	Placer County staff will engage with the business community to discuss efforts to support residents and employees (e.g., commuter benefits program).
Municipal Services: NTPUDD, North Tahoe Fire	Advisory	Placer County, TART, and TRPA will coordinate closely with the region's municipal services and recreational assets to ensure that the service areas comply with policies and regulations, and evacuation concerns.
Downtowner and Mountaineer Staff	Advisory	Placer County staff will seek advice from community members that have experience developing and implementing microtransit service.
Consultant teams	Support	Planning and implementation will require additional support from branding, marketing, and transit planning experts.

ENCOURAGING COMMUTE CHOICES

Implementing a microtransit shuttle program will likely shift a portion of visitors and residents out of their vehicles and onto transit. However, as noted, the Resort Triangle requires a multifaceted approach to curb congestion and vehicle trips. Therefore, in coordination with parking management and microtransit recommendations, Placer County will coordinate with TRPA to implement a regional vehicle trip reduction program to encourage employees to commute by non-driving modes.

BENEFITS OF A REGIONAL, EMPLOYEE-BASED TRIP REDUCTION PROGRAM

Like Placer County, TRPA aims to reduce the Basin's vehicle dependency through the promotion of non-driving modes. Considering that TRPA's goal is on par with Placer County's trip reduction ordinance, it is advantageous for the agencies to work together. Placer County proposes implementing a regional, employee-based trip reduction program, which would be co-sponsored by TRPA and Placer County.

Successful employee-based trip reduction programs require strong partnerships; it is difficult to achieve trip reduction goals without equal investment between the government agencies and the employers. Moreover, an effective program takes time to mature. Program expectations need to evolve as participating employment sites familiarize themselves with the program and program requirements. During program development, Placer County will shape the implementation phases of a regional trip reduction program. The following aspects are recommended based on city and regional precedents.

- **Phase 1 – Program launch, first year:**
  - A trip-reduction program can be launched through an introductory email to participating employment sites. Emails, which can be directed to owners, property managers, and commute coordinators, should clearly describe the trip reduction ordinance and action steps:
    - (1) the assessment of existing on-site vehicle trip reduction strategies,
    - (2) the administration of an employee commute survey;
    - (3) and the sharing of data through an online portal or spreadsheet.[10]
  - Upon receiving commute data from participating employment sites, the regional coordinator would calculate the baseline non-driving mode split for each site, and the region overall. *Note:* In the first year of the program, while sites should be required to participate, sites should not be penalized if their trip-reduction target is not met. Trip reduction programs are more effective when employment sites can ease into program requirements.
- **Phase 2 – Program implementation, second year:**
  - Similar to Year 1, the trip-reduction program should be launched by sending an email to participating sites with key action steps. Often, cities and regions require sites to pay an administrative fee -- this is not a penalty but rather a 'pay-to-play' cost to fund the regional coordinator position. Alternatively, some municipalities introduce a fine when sites do not meet their trip reduction target. Rather than introducing fee collection in Year 2, it is more effective to notify sites that fees will be collected starting in Year 3.

[10] While it is not required, sites are encouraged to include additional travel and commute questions that are specific to the site.

- Upon receiving commute data from participating sites, the regional coordinator should calculate the non-driving mode split for each site and compare results to Year 1 findings. It is common practice to introduce gamification features in the second year of the program to incentivize program participation. (E.g., award certificates)

- **Phase 3 – Ongoing program management, third year and beyond:**
  - At this point, sites are anticipating the launch of the program, the structure of the program should stay consistent and administrative fees or fines to sustain the program may be included. If a site is fined, the regional coordinator should work closely with the site's property manager to amend the on-site trip reduction program. Evaluate based on the following questions:
    - *What strategies are working?*
    - *Which strategies need to be replaced?*
  - By Year 3, the regional coordinator should be able to assess sites' progress overtime. Sites should be rewarded if they are making progress towards their trip reduction target; consider expanding gamification efforts to create friendly competition between sites.
  - Heading into the fourth year, the program will sustain itself; employers and employees will understand what they are contributing to and be motivated to have a robust on-the-ground trip reduction program, independent of the region's efforts.

The following recommendations speak to the industry's best practices related trip reduction programs. In partnership with TRPA, Placer County will refine the recommendations as part of the County's trip reduction ordinance update.

Source: LSC Transportation Consultants

RECOMMENDATIONS

- **Set a regional non-SOV commute target.** Together, TRPA and Placer County plan to establish a non-SOV commute target to establish program expectations. For example, the City of South San Francisco requires employers to, at a minimum, achieve a 28 percent non-SOV mode split. In other words, 28 percent of participating employees need to commute by a non-SOV option (e.g., carpool, transit, walking, biking). Every year, participating employers' mode-split is calculated. If employers are out of compliance (i.e., below 28 percent non-SOV), the on-site program coordinator needs to introduce more effective trip reduction strategies. Financial penalties or inspections can be introduced if an employer continues to be non-compliant.

A short-term non-SOV target – starting with a reachable goal (e.g., 25 percent) – will acquaint employers and employees with new program requirements before setting a higher target that reflects the region's broader trip-reduction goals.

- **Offer a broad menu of trip reduction strategies.** The success of a trip reduction program is dependent on an employer's ability to implement strategies that encourage employees to travel more sustainably. However, approaches that work well for one employment site may not be effective elsewhere. Therefore, a regional employee-based vehicle trip reduction program should incorporate a broad menu of TDM strategies to allow employers to select strategies that best fit their employees' needs.

While the following table is not comprehensive, it includes more than 20 strategies that are effective approaches for reducing vehicle trips. In the next phase of program development, Placer County and TRPA will finalize a menu of strategies. Note: In the wake of COVID-19, telecommuting has become a more effective trip reduction strategy. As commute behaviors continue to evolve, it will be important that TRPA and Placer County keep program parameters flexible.

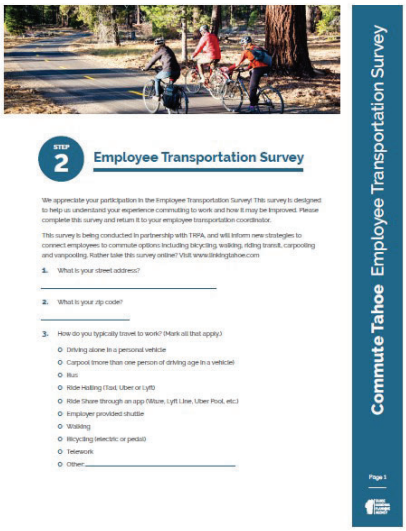
Recommended TDM Strategies, by Effectiveness[11]

TDM Strategy	Effectiveness	TDM Strategy	Effectiveness
Parking incentives (cash back or parking fees)	High	**Telecommuting and alternative work schedules**	High
Shuttle bus program	High	**Employee TDM coordinator**	Medium
Free or subsidized transit passes for employees	High	**Loaner bikes or e-bikes**	Medium
Reduced parking supply	High	**Carpool ridematching**	Medium
Unbundle parking costs	High	**Preferential carpool/vanpool parking, carpoolers**	Medium

[11] Effectiveness refers to the weight a strategy has for reducing a company's vehicle trips

Recommended TDM Strategies, by Effectiveness[11]			
TDM Strategy	**Effectiveness**	**TDM Strategy**	**Effectiveness**
Regional Coordinator at Placer County	High	**On-site facilities (childcare, fitness center, bank)**	Medium
Commuter Management Platforms (Ride Amigos)	Medium	**Vanpool matching**	Low
Commuter Challenges and Reward Events	Medium	**Commuter tax benefit**	Low
Subsidized bike sharing or ride sharing programs	Medium	**Bicycle User Group (BUG)**	Low
Guaranteed Ride Home	Low	**Improved walking conditions**	Low
Bike racks, gear storage, and showers	Low	**Employee intranet sites**	Low
Free Wi-Fi devices for employees	Low		

- **Set a regional job description for employer-based TDM coordinators.** Effective program coordinators are critical to the success of an employer-based vehicle trip reduction program. Over time, the role has evolved and now includes several responsibilities: program champion, liaison, and survey management. Placer County's current trip reduction ordinance and TRPA's Commute Tahoe Program provide employers with direction on the roles and responsibilities of a program coordinator. While both programs detail similar expectations, TRPA's program strongly advises that the coordinator delegate tasks by involving other employees and departments at the business site. This prevents an implementation from resting on the shoulders of one person. Based on TRPA's approach, the following responsibilities should be included as part of a regional job description:
  - Serves as Point-of-Contact between staff and the government agency
  - Inventories existing infrastructure, services, and policies related to transportation in the workplace
  - Leads development of site's commute program
  - Leads and delegates implementation of the commute program
  - Monitors the overall commute program through the administration of an annual survey
- **Manage a regional survey and database.** Best practices suggest that effective employer-based TDM programs include the administration of an annual employer survey. A regional program should include a standardized employee survey to track the program's progress at the regional level. A simple, uniform survey will allow the County to make comparisons across employee sites, assess TDM strategies and programs, and identify improvements that need to be made.



In combination with an online survey, value is added when survey data is stored in a database to efficiently aggregate data and calculate an annual mode-split for employers and for the County. TRPA has taken initial steps to create a web-based portal for Tahoe Basin employers. Upon creating an account, employers have access to an online survey and can track annual progress. Ideally, the existing portal would be expanded to include employers within the County's jurisdiction. The County's management of a regional survey and database will help to sponsor the region's longer-term transportation congestion and trip reduction goals.

PARTNERSHIPS AND NEXT STEPS

The next step is to continue coordinating with TRPA. A shared vision is foundational for determining the details of a regional TDM program. Upcoming conversations will include setting the regional non-SOV commute target and aligning annual reporting expectations. Discussions will be supported by transportation consultants and TDM coordinators who are well-versed in the development and implementation of regional TDM programs.

ACTIVE TRAVEL CONNECTIONS

The recommended improvements discussed above will be supported by the many ongoing or upcoming active transportation projects planned within the Resort Triangle. These walking and biking improvements form critical first-mile and last-mile connections for transit riders. They also allow "park-once" residents and visitors to park their vehicle near one of their destinations and walk or bike to other destinations in the area. In addition to improving the connections for these other modes, these improvements also allow visitors and residents the option for a safe and comfortable walking or biking trip to their destination.

BUILDING OFF EXISTING PLANS

The Plan does not make any new recommendations for walking and biking improvements in the Resort Triangle. These improvements have been previously identified and planned for through numerous studies, including the *Tahoe Basin Area Plan* (2017), *Linking Tahoe Active Transportation Plan* (2018), *Lake Tahoe Corridor Connection Plan*, *Martis Valley Community Plan*, and TRPA *Regional Transportation Plan* (2017), among others.

EXPANDING TRAILS

Placer County has also identified five planned multiuse trails extending through the Resort Triangle to form a continuous multiuse trail network throughout the area as shown in the figure. These trails improvements total over 27 miles of new trail, including the quarter-mile gap closure project for the Lakeshore Trail in Tahoe City, and the 2.2-mile-long Dollar Creek Trail segment completed in 2018. In addition to these recent improvements, a segment of the Martis Valley Trail will begin in 2020 connecting between Northstar and SR 267, and a Truckee River Trail segment

extending from the northern Placer County boundary south on SR 89 will begin construction in 2022. These multiuse trail expansions continue to expand the recreational and commercial destinations that residents and visitors can access comfortably walking and biking without accessing a vehicle. Additionally, as the use of electric-powered bikes ("e-bikes") continues to expand in the Resort Triangle and nationally, the distances that people will be willing to bicycle for trips is likely to increase as e-bikes allow trips to be taken more easily by bike. Given this trend, expanding the network of comfortable biking opportunities to connect destinations will become increasingly important. The identified trail improvements serve this opportunity by connecting destinations across the Resort Triangle and the Tahoe Basin more broadly.

TOWN CENTER IMPROVEMENTS

In addition to the trail improvements noted above, a series of streetscape and other improvements have been planned or undertaken to improve walking and biking in the town centers of Tahoe City and Kings Beach. The Kings Beach Commercial Core Improvement Project reimagined a section of SR 28 in Kings Beach and added bike lanes and sidewalks to facilitate walking and biking in the area. The ongoing SR 89/Fanny Bridge Community Revitalization Project allows through vehicles to bypass Tahoe City to continue south and provides bike lanes and sidewalk improvements to create a more friendly environment for people walking, biking, or taking transit to Tahoe City as well as creating the Tahoe City River District planning area as an area oriented toward walking and biking. The *Tahoe City Mobility Plan* addresses current pedestrian and bicycle gaps in Tahoe City and opportunities to reorient parking and circulation, and improve pedestrian crossings (such as the recommended crossing improvements at SR 28 and Grove Street), to create a vibrant pedestrian-oriented downtown.

FUTURE INTEGRATION

As the Plan recommendations are moved forward into project development, integrating and connecting them to previously adopted or completed active transportation plans and ongoing projects will be critical to providing seamless connections between modes and allowing residents and visitors to reduce their need to use a private automobile to travel to and within the Resort Triangle.

CONCLUSION

This Plan provides a vision and set of recommended strategies to improve travel and quality of life in the Resort Triangle by encouraging and investing in programs and infrastructure that promote transit, walking, biking, and carpooling to reduce dependency on single or low occupancy vehicles. These strategies are in line with the statewide effort, reflected in Senate Bill 743 and Senate Bill 375, to reduce the number of miles traveled by vehicles, helping us to reduce congestion, improve air quality, and enhance the livability of our communities.

The goal of Senate Bill 1 (Road Maintenance and Rehabilitation Account) is to address road maintenance, rehabilitation, and safety needs on both the state highway and local streets and road systems. Additionally, Senate Bill 1 includes the Sustainable Communities Grant Program with a goal to promote sustainability, preservation, increased mobility, increased safety, enhanced innovation, economic vitality and equity, health benefits, and social equity within communities throughout California. This program is administered by Caltrans through a statewide competitive grant application program and is the funding source for this effort. The strategies provided in this Plan not only support the RTTP mission and objectives, they serve to meet the greater Statewide goals set out under the Sustainable Communities Grant Program.

As indicated by the recommendations in this Plan, transit is one of the most critical components for the Resort Triangle to be able to serve the influx of visitors throughout the year. A robust transit network that can provide reliable and frequent service through a combination of fixed-route service for longer trips and on-demand service

for shorter trips is critical to providing a convenient alternative to driving throughout the year. The recommendations in this Plan continue to build off transit policies and planning principles in the Region. Future advancements, beyond the scope of this Plan, could include establishing regional transit hubs that provide a place for visitors to park once and then use transit to access their destinations. This would require partnerships with partner agencies, ski resorts, and organizations throughout the region to design the service characteristics, funding, and operations. Approaches like these have served mountain resort communities around the country well by enabling those communities to keep their built roadway infrastructure sized for year-round residents while still serving visitors in peak seasons.

Adopting and advancing the recommendations in this Plan is the beginning of innovative solutions that will help maintain the precious environmental and recreational resources in the Resort Triangle, while making them accessible to many.

VI. APPENDICES

The following appendices contain additional information regarding the data, analysis, and input that informed the recommendations presented above.

- Appendix I – Data Collection Technical Memorandums
- Appendix II - Adaptive Corridor Management Technical Memorandum
- Appendix III – Parking Management Technical Memorandum
- Appendix IV - TDM Technical Memorandum
- Appendix V - Community Outreach Summaries